OCTOBER 22, 1960

Chemical Week

A McGRAW-HILL PUBLICATION PRICE FIFTY CENTS

Nixon or Kennedy? Here's how CPI sizes up candidates and issues . . . . p. 25

Water softeners get harder sell. Gainer: ion-exchange resins . . . . . p. 49

Natural rubber feels the pinch as 'synthetic natural' output grows . . . p. 81

Research managers weigh merits of 'analyze it yourself' trend . . . . . p. 89

◀ PROGRAMING NEW VERSATILITY INTO CONTROL COMPUTERS . . p. 31

STEVENS RICE GS
UNIVERSITY MICROFILMS INC
313 N 1ST ST
ANN ARBOR MICH C

The day they threw orchids away!

So great was the need for rubber in 1876 that when 70,000 wild rubber tree seeds arrived from Brazil, the Royal hothouses of London were quickly emptied—orchids and all—to make room for raising the young plants that led to the first rubber plantation.

Now, the chemical laboratory is the "hothouse" for a new kind of rubber. In performance and chemical structure, new Shell Isoprene Rubber is so nearly identical to natural rubber that manufacturers can assign it to jobs once restricted to tree-born rubber. Shell Chemical's new product is even used in heavy-duty truck tires—most punishing assignment of all—where no previous man-made rubber made the grade!

Adding polyisoprene to the nation's rubber supply is another important way Shell Chemical stretches our vital resources.

SHELL

Shell Chemical Company

Chemical Partner of Industry and Agriculture

TORRANCE, CALIFORNIA

HARSHAW
FLUORIDES

Boron Trifluoride
Hydrofluoric Acid
ANHYDROUS . . . AQUEOUS

The uses for Fluorides are ever increasing. Harshaw Fluoride production also has increased steadily. Shipments of cylinders and tank cars leave our plant daily. If required, you are invited to draw on the knowledge and experience of our staff of technical specialists on Fluorides.

Write for your free copy of M.C.A. Chemical Safety Data Sheet SD-25 on properties and essential information about...
HYDROFLUORIC ACID
Anhydrous and Aqueous

THE HARSHAW CHEMICAL CO.
1945 EAST 97th STREET • CLEVELAND 6, OHIO
Chicago • Cincinnati • Cleveland • Detroit
Hastings-On-Hudson, N. Y. • Houston
Los Angeles • Philadelphia • Pittsburgh

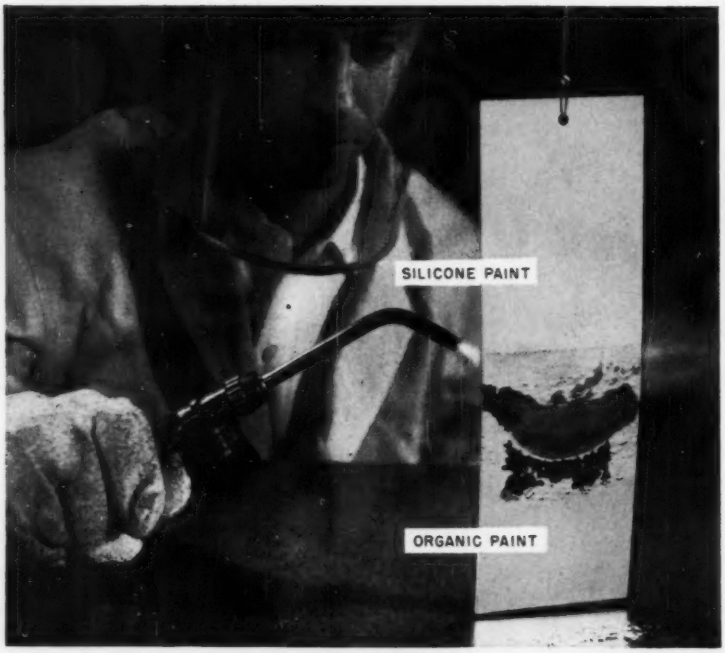
Here is a helpful list of HARSHAW high-quality fluorides:

Ammonium Bifluoride
Ammonium Fluoborate
Barium Fluoride
Bismuth Fluoride
Boron Trifluoride Complexes
Chromium Fluoride
Copper Fluoborate
Fluoboric Acid
Fluorinating Agents
Frosting Mixtures
Hydrofluoric Acid Anhydrous
Hydrofluoric Acid Aqueous
Hydrofluosilicic Acid
Laboratory Fluorine Cells
Lead Fluoborate
Lithium Fluoride
Metallic Fluoborates
Potassium Bifluoride
Potassium Chromium Fluoride
Potassium Fluoborate
Potassium Fluoride
Potassium Titanium Fluoride
Silico Fluorides
Silicon Tetrafluoride
Sodium Fluoborate
Tin Fluoborate
Zinc Fluoborate
Zinc Fluoride

HARSHAW

SILICONE NEWS from Dow Corning

New Paint For Hot Spots



Silicone-based paints stay put ...resist corrosion, weathering

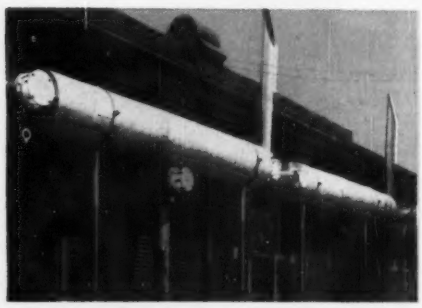
Guarding metal surfaces from weathering and chemical attack is tough enough. Keeping them protected when surface temperatures climb to 700 F, 800 F — even 1000 F — is tougher still. Most paints fail rapidly, blister and peel. But paints based on Dow Corning Silicones retain their protective properties, even on the hottest jobs.

Whether the surface stays hot, or shuttles between hot and cold, makes no difference to a silicone paint. Here's a new kind of protective coating . . . one that you can depend on to provide real protection, withstand oxidation, corrosive atmospheres or weathering. When paint lasts like this — from 25% to 100% longer — you save money because (1) less paint is required; (2) costly downtime and labor are greatly reduced.

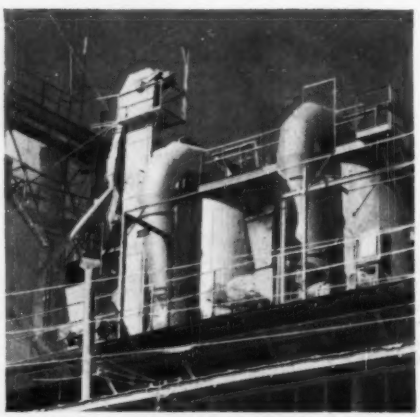
Another plus: Silicone-based paints are available in a wide range of colors. This means you can carry color-coding over onto hot equipment without worrying about early paint failure. To new product designers, this feature means finishes that resist chalking, checking, fading — retain their original beauty and protection.

For protecting a "hot spot" or a "hot product", it'll pay you to use paints made with Dow Corning silicone resins. Write today for more information.

"After 5 years, silicone paint still protects bronze-melting furnace. Organic paints failed within days after application."
BEARING MANUFACTURER



"After two years, mufflers coated with silicone paint are still in good shape. Organic paint used on similar 500 F mufflers burned away long ago."
PUBLIC UTILITY



"By far the most satisfactory paint we have ever used on kilns and stacks with surface temperatures of 650 to 750 F."
BASIC CHEMICAL MANUFACTURER

Send for illustrated brochure, "Why Silicone-Based Paints Mean Less Maintenance", plus list of suppliers. Address Dept. 2210.

first in silicones

Dow Corning CORPORATION
MIDLAND, MICHIGAN

ATLANTA BOSTON CHICAGO CLEVELAND DALLAS LOS ANGELES NEW YORK WASHINGTON, D. C.

ON THE COVER: The tub of electrical "spaghetti" shown is Jersey Production Research Co.'s analog computer. Originally purchased for interpreting oil well drilling data, it can be used to adapt digital computers to process control work.

Chemical Week

5 **VIEWPOINT**— The melamine antitrust suit: another "cellophane case?"

7 **LETTERS**

7 **MEETINGS**

21 **BUSINESS NEWSLETTER**

25 CPI views the campaign. Big issue for industry: sound economy.

27 **Canadian chemical companies fight Alberta-Illinois LPG pipeline.**

27 FDA calls industry conference on additive-testing bottleneck.

28 Jersey Standard and partner press appeal on Spanish petrochemical plan.

28 Du Pont neoprene venture marks new Japanese foreign-investment ease-up.

28 Outlays for foreign plants found rising in new industry survey.

31 **ENGINEERING**— Computers do double duty: process control, plus usual jobs.

39 **WASHINGTON NEWSLETTER**

43 **ADMINISTRATION—Story behind U.S. Borax' reorganization.**

49 **SPECIALTIES**— New water-softener lease plan promises boost to resin sales.

52 New entries put glow in sales of self-luminous products.

56 Internal dyes bid to replace surface colorants for plastic lenses.

59 **TECHNOLOGY NEWSLETTER**

65 **SALES—Linde plans new multicustomer, industrial gas distribution system.**

66 McGuire Chemical Co. opens third deepwater terminal, at Vancouver, Wash.

73 **PRODUCTION—New Kansas City firm treats industrial waste on contract.**

77 **MARKET NEWSLETTER**

81 **MARKETS**— "Synthetic natural" rubber begins foray into natural rubber markets.

89 **RESEARCH**— Self-service chemical analysis is trend in research labs.

95 New Firestone instrument speeds testing of rubber properties.

96 **BUSINESS BENCHMARKS**

Chemical Week (including Chemical Specialties and Chemical Industries) is published weekly by McGraw-Hill Publishing Co., James H. McGraw (1860-1948), founder. EXECUTIVE, EDITORIAL, CIRCULATION AND ADVERTISING OFFICES: McGraw-Hill Building, 330 West 42nd St., New York 36, N. Y. Telephone, LO 4-3000; Teletype, TWX N.Y. 1-1636; Cable, McGRAWHILL, N.Y. Place of publication: Philadelphia, Pa. Second class postage paid at Philadelphia. (See below for directions regarding subscriptions or change of address.) OFFICERS OF THE PUBLICATIONS DIVISION: Nelson L. Bond, president; Shelton Fisher, Wallace F. Traendly, senior vice-presidents; John R. Callaham, vice-president and editorial director; Joseph H. Allen, vice-president and director of advertising sales; A. R. Venezian, vice-president and circulation coordinator. OFFICERS OF THE CORPORATION: Donald C. McGraw, president; Joseph A. Gerardi, Hugh J. Kelly, Harry L. Waddell, executive vice-presidents; L. Keith Goodrich, vice-president and treasurer; John J. Cooke, secretary.

United States and United States possessions subscription rate for individuals in the field of the publication, $3 per year; single copies, 50¢. Foreign subscription rates per year: Canada, $4; other Western Hemisphere countries, $15; all others, $25, payable in advance. Printed in U.S.A. Title registered in U.S. Patent Office.

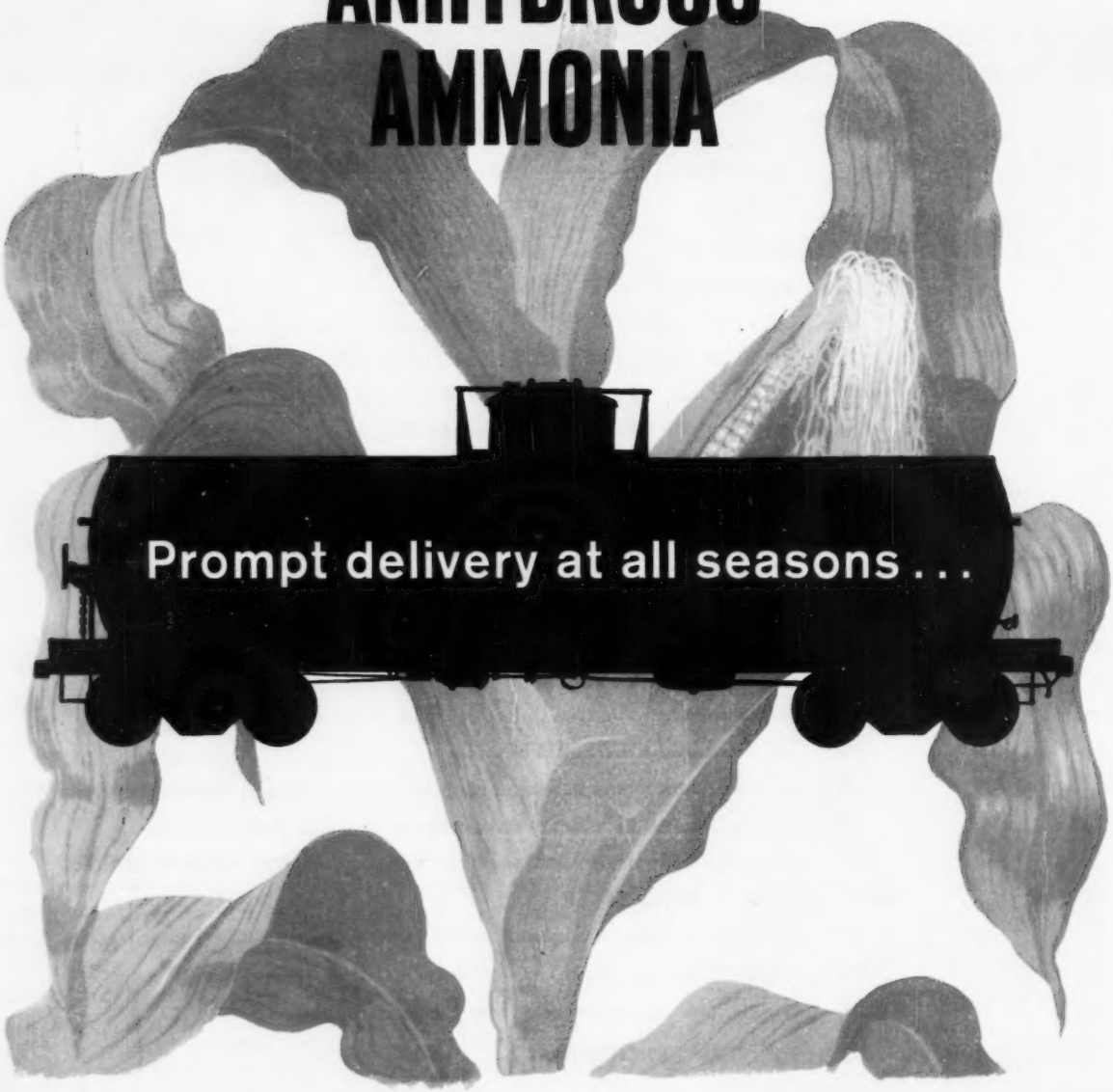
© Copyright 1960 by McGraw-Hill Publishing Co. Inc. All rights reserved. UNCONDITIONAL GUARANTEE: the publisher, upon direct request from any subscriber to our New York office, agrees to refund the part of the subscription price applying to copies not yet mailed.

Subscriptions to Chemical Week are solicited from management men in the Chemical Process Industries in administration, production and plant operation, design and construction, research and development, sales and purchasing. Position, company connection and nature of company's business, products and approximate number of employees must be indicated on subscription application. Send to address shown below.

SEND SUBSCRIPTION CORRESPONDENCE AND CHANGE OF ADDRESS TO FULFILLMENT MANAGER, CHEMICAL WEEK, 330 WEST 42nd ST., NEW YORK 36, N. Y. SUBSCRIBERS SHOULD NOTIFY FULFILLMENT MANAGER PROMPTLY OF ANY CHANGE OF ADDRESS, GIVING OLD AS WELL AS NEW ADDRESS, AND INCLUDING POSTAL ZONE NUMBER, IF ANY. IF POSSIBLE, ENCLOSE AN ADDRESS LABEL FROM RECENT ISSUE OF CHEMICAL WEEK. PLEASE ALLOW ONE MONTH FOR CHANGE TO BECOME EFFECTIVE.

Postmaster: Please send Form 3579 to Chemical Week, 330 West 42nd St., New York 36, N.Y.

SINCLAIR ANHYDROUS AMMONIA



FARMERS CAN'T AFFORD to settle for "too little – too late," when it's time to apply fertilizer. Farmers depend on *you* to supply their needs right on schedule.

You can depend on Sinclair for getting *your* requirements of anhydrous ammonia and nitrogen solutions delivered on time to your plant, even during your peak season.

With vast, centrally-located storage for anhydrous ammonia and nitrogen solutions at Hammond, Indiana, Sinclair is always prepared to ship whatever quantities you need – at a word from you.

SINCLAIR PETROCHEMICALS, INC.

Subsidiary of Sinclair Oil Corporation, 600 Fifth Avenue, New York 20, N.Y. • 155 North Wacker Drive, Chicago 6, Ill.

Chemical Week

Robert S. Muller ..... Publisher

Howard C. E. Johnson ..... Editor-in-Chief
Ralph R. Schulz ..... Managing Editor
Emil J. Mikity ..... Assistant Managing Editor
J. Robert Warren ..... Assistant Managing Editor
Donald P. Burke ..... Associate Editor
Anthony J. Piombino ..... Associate Editor

DEPARTMENTS
Administration .... Cooper R. McCarthy, editor; F. Bryan Williams
Business News ..... Homer Starr, editor; Charles Joslin; Gary G. Reibsamen
Engineering ..... Ryle Miller, editor; Donald M. Levin
Foreign ..... Bruce Bendow, editor
Markets ..... Philip A. Cavalier, editor; Richard T. Ozimek
Production ..... Herbert C. Short, editor
Research ..... Joseph F. Kalina, editor; Philip A. Untersee
Sales ..... Carl A. Hiester, editor; Victor H. Waldrop
Specialties ..... Richard J. Callahan, editor; Marion L. Meade
Reports ..... Jorma Hyypia, editor
Copy ..... William Mullinack, editor; Kay Sarner; Patty Moffitt
Art ..... Robert T. Martinott, director; Richard Kluga; Forbes Linkhorn; Dolores Able
Buyers' Guide ..... Betsy L. Emery, editor

REGIONAL EDITORS
Chicago ..... John M. Winton, editor; Nina Seawick
Houston ..... Thomas H. Arnold, editor; Wilma Cortines
San Francisco ..... Martin D. Robbins, editor; Terry Shaw

NATIONAL AND WORLD NEWS
Dexter M. Keezer ..... Economics
John Wilhelm ..... Director, News Bureaus

Domestic
Atlanta, B. F. Barnes; **Chicago**, Stewart Ramsey; **Cleveland**, Arthur Zimmerman; **Dallas**, Marvin Reid; **Detroit**, Donald MacDonald; **Los Angeles**, Kemp Anderson, Jr.; **San Francisco**, Jenness Keene; **Seattle**, Ray Bloomberg; **Washington**, George B. Bryant, Jr. Correspondents in 75 principal cities of the United States.

Foreign
Beirut, O. M. Marashian; **Bonn**, Pete Forbath; **Caracas**, John Pearson; **London**, John Shinn; **Melbourne**, Alicja Grobtuch; **Mexico City**, Peter Weaver; **Moscow**, Ernest Conine; **Paris**, Robert E. Farrell; **Rio de Janeiro**, Leslie Warren; **Tokyo**, Sol Sanders. Correspondents in 78 cities.

Knox Armstrong .... Advertising Sales Manager
Alvin J. Babkow ..... Business Manager
Fred E. Lesner ..... Sales Promotion Manager
John M. Pierce ..... Market Service Manager
Robert L. Maier ..... Advertising Makeup
Paul W. Erb ..... Circulation Manager
Frances Regan ..... Reprints
Advertising Salesmen ..... See Adv. Index

Competition Is the Question

FLASH FROM FIRING the melamine antitrust salvo at American Cyanamid (*CW, Oct. 15, p. 24*), Assistant Attorney General Robert A. Bicks—in charge of the Justice Dept's Antitrust Division—dropped into New York last week to tell Wall Streeters about the aims and workings of his antitrust enforcement program.

Mr. Bicks—a diligent and dedicated public servant—is well aware that his job, as he puts it, "raises questions of judgment and policy." The melamine suit does indeed raise questions.

One question that might be asked: Does this suit threaten punishment to Cyanamid for having competed successfully? Back in the 1930s, Cyanamid found its thiourea-formaldehyde Beetleware at a disadvantage vis-a-vis other producers' urea-formaldehyde plastics. Then Cyanamid substituted melamine for thiourea, thereby gained the upper hand in some important applications. Is anything wrong with this kind of competition—outdoing your rivals by developing superior products?

Another basic question: Is it necessary to have intense competition at every conceivable stage of manufacture? Melamine resins, for example, find their largest usage in plastic dinnerware.

- There is bitter competition among producers of chinaware, earthenware, and plastic table settings. (Right now, the plastics people may be taking about one-third of this market.)
- Within the plastics sector of the dinnerware industry, there has been such spirited competition that the Federal Trade Commission established a special code to stamp out illegal advertising, pricing, and other marketing practices.
- The several-dozen molders of melamine dinnerware can buy their molding resins from at least two large producers, Cyanamid and Allied Chemical (both with excess capacity, relative to current demand).

Here the picture changes: Cyanamid is clearly the world's pre-eminent producer of melamine and its customary intermediate, dicyandiamide (dicy).

But, in any case, the price and quality of Cyanamid's melamine are effectively governed by the molders' competitive struggle against the makers of chinaware and earthenware.

Still other questions arise in scanning the list of "effects" of the alleged monopoly in melamine. How has Cyanamid "suppressed" development of processes for producing melamine from materials other than dicy? (Du Pont and Cyanamid itself have patents on urea-based processes, and Allied reportedly has found another route starting from urea.) If Cyanamid has kept melamine prices "at unreasonably high levels," wouldn't that tend to stimulate, rather than stifle, competition in both research and production? Why should Cyanamid, allegedly making such a killing on each pound of melamine it sells, have "discouraged and impeded development of new uses for melamine"?

But harking back to the fundamental charge of monopoly, one wonders if the melamine suit may be doomed by the precedent set in the cellophane case. In that action, both the trial court and the U.S. Supreme Court cleared Du Pont of all charges, reasoning that, although Du Pont may have been the sole U.S. producer of cellophane at one time, it still had to face plenty of competition from producers of other flexible packaging materials (*CW, June 23, '56, p. 21*). In the melamine suit, it may well be found that Cyanamid too is competing with all the intensity that the law requires.

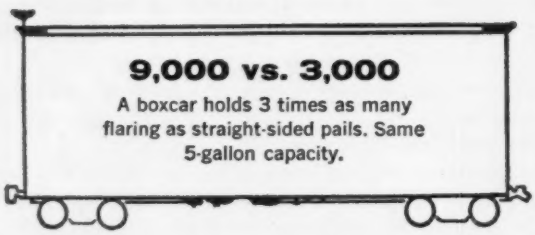
LEAKPROOF
electrically welded flaring pails

LEAKPROOF PROTECTION FOR HARD-TO-HOLD PRODUCTS

Hard-to-hold products take to Continental's Flaring Pails the way ducks take to water. These are the perfect containers for liquid roofing cements, paint and petroleum products, dry or powdered materials.

EASY NESTING SAVES STORAGE SPACE

Continental's Flaring Pails nest easily and safely. And because they take up less room than straight-sided pails, they save storage and shipping costs.



9,000 vs. 3,000

A boxcar holds 3 times as many flaring as straight-sided pails. Same 5-gallon capacity.

SINGLE ELECTRICALLY WELDED SEAM FOR STRENGTH

Continental's Flaring Pails are rugged enough to take even the roughest punishment. The single electrically welded seam adds strength to the pail...gives leakproof protection for every product.

CONTINENTAL CAN COMPANY

Eastern Division: 100 East 42nd St., New York 17
Central Division: 135 So. La Salle St., Chicago 3
Pacific Division: Russ Building, San Francisco 4
Canadian Division: 790 Bay St., Toronto 1
Cuban Office: Apartado 1709, Havana

LETTERS

Low-Pressure CO_2

TO THE EDITOR: I have read with interest your article "Putting New Heat on Fire Fighting" (*Sept. 17, p. 91*). This article mentioned most of the common fire-extinguishing agents and some of the uncommon ones; however, it omitted one that is industrially important. I am referring to the widespread use of bulk low-pressure carbon dioxide as opposed to high-pressure carbon dioxide stored in cylinders.

The term "high pressure" is used to describe carbon dioxide stored in cylinders at ambient temperature because the pressure is normally about 1,000 psi. and may approach 2,000 psi. in hot weather. The cylinders must therefore be strong enough to resist the maximum internal pressure, and the size is limited to a maximum of 100 lbs. of carbon dioxide capacity.

Low-pressure carbon dioxide, on the other hand, is stored in an insulated pressure vessel that is refrigerated to maintain a temperature of 0 F. Under this condition the pressure does not exceed 300 psi., and the vessel can be constructed by normal welding techniques for practically any capacity desired. For example, common sizes range from 1 ton to 40 tons and a number of store units are on service with capacities of 125 tons. . . .

H. V. WILLIAMSON
Director of Research
Cardox
Chicago

We mentioned carbon dioxide, of course, but without going into details of high- and low-pressure systems.—ED.

Hydrides Cost

TO THE EDITOR: The report on metal organics (*Sept. 17, p. 52*) by A. R. Anderson is comprehensive and well done. However, there's one major error of concern to Metal Hydrides Inc.: " . . . alkyl aluminum hydrides, for example, are relatively inexpensive ($2/lb.) replacements for more expensive ($10/lb.) lithium aluminum hydride and sodium borohydride" (*p. 74*).

The truth of the matter is that diisobutyl aluminum hydride selling at $2/lb. is about as expensive a reducing agent as lithium aluminum hydride selling at a price of $33/lb. This is because of the very large differences in the reducing equivalent weights of the two materials. Diisobutyl aluminum hydride (MW=142) has only two reducing electrons available. Therefore the reducing equivalent weight is 71. Lithium aluminum hydride (MW=38), on the other hand, has eight reducing electrons available. Its reducing equivalent weight is 4.75, or about 1/15 that of diisobutyl aluminum hydride. Therefore on a cost basis the two materials are about equal at the present time. On a practical basis lithium aluminum hydride is far more desirable since it is a solid, stable in air, while diisobutyl aluminum hydride is a pyrophoric liquid, which is very difficult to handle in the usual equipment available to fine-chemicals producers.

Pure sodium borohydride (MW=38, reducing equivalent weight=4.75) selling at $19.90 (5,000-lb. quantities) is a far cheaper reducing agent than diisobutyl aluminum hydride. Furthermore, almost all borohydride reactions are carried out in aqueous solutions, which is impossible with the dialkyl aluminum hydrides.

ROBERT C. WADE
Manager, Market Development
Metal Hydrides Inc.
Beverly, Mass.

MEETINGS

Technical Assn. of the Pulp and Paper Industry, 15th engineering conference, Robert Meyer Hotel, Jacksonville, Fla., Oct. 24-28.

Western Petroleum Refiners Assn., question-and-answer session on refining technology, Rufus Garrett Hotel, El Dorado, Ark., Oct. 26-27.

Fiber Society, fall meeting, Washington Hotel, Washington, D.C., Oct. 27-28.

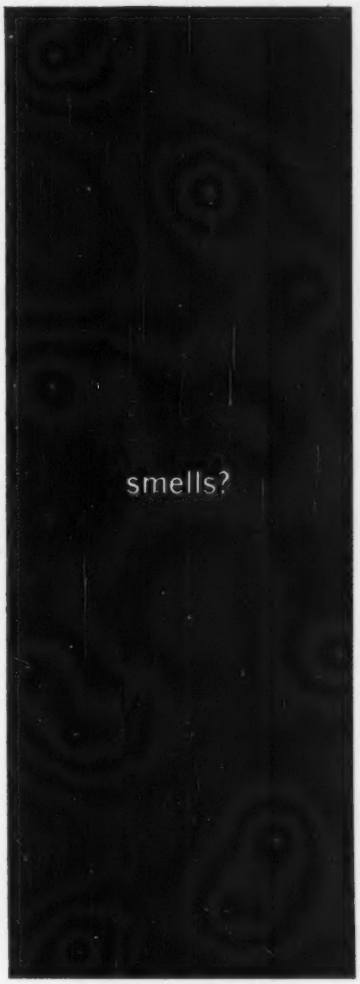
National Paint, Varnish & Lacquer Assn., annual convention, Drake Hotel, Chicago, Oct. 27-29.

Chemical Market Research Assn. Pittsburgh Hilton Hotel, Pittsburgh, Nov. 9-10.

Building Research Institute, 1960 fall conferences, sessions on "preassembled components" and "structural foams," Shoreham Hotel, Washington, D.C., Nov. 15-17.

Manufacturing Chemists' Assn., 10th semiannual meeting and midyear conference, Hotel Statler Hilton, New York, Nov. 22.

Glass Container Manufacturers' Institute, semiannual meeting, Boca Raton, Fla., Nov. 28-Dec. 1.



Call on Rhodia "Odor Engineering" to solve your malodor problems in plant or product

Rhodia Inc. is the world leader in industrial odor control and reodorization technology and a primary producer of industrial aromatic chemicals. It offers fully qualified consultation service anywhere in the United States without cost or obligation.

RHODIA INC., 22-1
60 East 56 St., New York 22, New York
Gentlemen:
Please send me Rhodia literature.
My problem is: (please give specifics)

NAME
ADDRESS
CITY STATE

RHODIA INC.
60 East 56 St., New York 22, New York
(Phone: PLaza 8-4850)

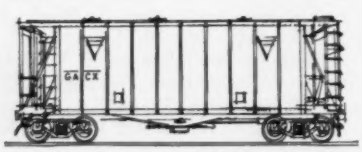
Let Our Tests Prove That Bulk Shipping Via AIRSLIDE® and DRY-FLO® Cars is Right For Your Product

When General American "okays" a product for shipment in AIRSLIDE and DRY-FLO cars, you know that you are getting the best and most economical method of bulk transportation. In its laboratories, General American investigates the flow properties of dry, powdered and granular materials, then if further assurance is necessary, test cars are available for checking performance under actual railroad conditions.

The first time you use these cars, experts are at your service to supervise the initial unloading and show your men the techniques for quick and efficient operation.

As a further service, General American maintains shops throughout the country, staffed by skilled technicians to ensure maximum "in-service" mileage for your AIRSLIDE and DRY-FLO cars.

It pays to plan with General American.



AIRSLIDE® AND DRY-FLO® CAR DIVISION

AIRSLIDE GENERAL AMERICAN TRADE MARK

GENERAL AMERICAN TRANSPORTATION CORPORATION

135 South LaSalle Street • Chicago 3, Illinois
Offices in principal cities
In Canada: Canadian General Transit Co., Ltd., Montreal

NEWS!
for makers of
DRY BLEACHES...
SCOURING POWDERS...
AUTOMATIC DISHWASHING COMPOUNDS...
SANITIZERS, INDUSTRIAL, FOOD SERVICE AND DAIRY DETERGENT-SANITIZERS...
AND OTHER CHEMICAL SPECIALTIES FOR HOME AND INDUSTRY!
Now is the time to take a long look at...
CDB®
Chlorinated Isocyanuric Acids and Salts!
fmc announces a major expansion in production!
Now CDB is more attractive than ever for new products that utilize chlorine in a convenient, dry form!
Look at these convincing facts...

HOUSEHOLD BLEACH—CDB-based products are safer, more convenient and easier to use than liquid bleaches. Quick dissolving rate and inherently safe bleaching action minimize fabric-weakening even after repeated use. Proven mildness also applies to synthetics and blends.

DISHWASHING COMPOUNDS—The addition of CDB's to automatic dishwashing compounds promotes free-rinsing and thereby reduces film and spotting on glassware.

SCOURING POWDERS—CDB's improve cleaning effectiveness because of the powerful oxidizing action of available chlorine and its fast dissolving rate. Improved stability of CDB's in granular form increases the shelf life of your product.

DETERGENT-SANITIZERS—Compatibility with most builders plus high germicidal activity make the CDB's ideally suited for use in cleaning compounds for hospitals, plants and public places.

LAUNDRY BLEACH—CDB dry bleaches require less storage space . . . no storage tanks. They may be handled easily and safely and are added dry, direct to the wash wheel. The danger of damaged clothes due to error or spillage is greatly reduced. Because of CDB's long term mildness, they prolong the life of institutional or rental linens and diapers.

SANITIZERS—High germicidal activity, good stability and rapid solubility commend CDB's for use in dairy and food plant sanitizers. They conform to U. S. Public Health Service Code for bactericidal effectiveness.

What are the CDB's?

CDB is the brand name for the FMC family of Chlorinated Isocyanurate Acids and Salts.

Where are they used?

In household, commercial, and institutional dry laundry bleaches; automatic dishwashing compounds; scouring powders; sanitizers; detergent-sanitizers and wherever bleaching and sanitizing action is desired.

How do they compare with other dry bleaches?

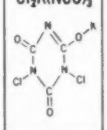
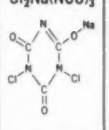
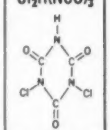
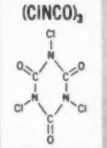
The CDB's offer greater bleaching effectiveness than any other dry organic bleach, are stable and are competitively priced.

How do they compare with liquid bleaches?

With the CDB's it is now possible to equal the bleaching effectiveness of liquid bleach while enjoying all the advantages of a dry product. They are more convenient to use; safer to handle; easier to package and ship; gentler on fabrics. They eliminate the danger of fabric damage due to mistakes in use.

What about sanitizing effectiveness?

CDB's meet the standards set by the U. S. Public Health Service.

	CDB-59	CDB-60	CDB-70	CDB-85
Formula	$Cl_2K(NCO)_3$	$Cl_2Na(NCO)_3$	$Cl_2H(NCO)_3$	$(ClNCO)_3$
Molecular Structure				
Average Available Chlorine, %	59	60	70	88
pH (1% solution)	6-7	6-7	2.5-3.5	2.5-3.5
Solubility (g/100 ml. soln.) at room temperature	10	25	1.5	1.2
Physical Form	powder or granular	powder or granular	powder or granular	powder or granular

Other advantages of CDB-based products are shown here.

Now...

new production spurs new interest in new products!

Market with complete confidence of perfomance!

During the time FMC has been manufacturing CDB's, many dry laundry bleaches and other chlorine-utilizing products have been successfully marketed! Application data has been carefully analyzed in FMC laboratories and formulations have been developed. The CDB's have been improved in physical and working properties and these perfected products are ready now for your profitable exploitation.

Market with complete assurance of supply!

Formulators are now assured ample supply for present and future needs.

Four different CDB's provide four different available-chlorine levels. Individual characteristics make each one particularly suited to specific applications. All are made in powder and granular form to suit a wide variety of product needs and all are stocked for prompt delivery. You can save money by combining shipments of CDB's with FMC phosphates.

Market with complete technical assistance of FMC!

An FMC representative will be pleased to discuss with you the new-product opportunities made possible by the CDB's. He will assist you in choosing the form best suited to your requirements and recommend starting formulations. For complete information, contact our nearest office.

fmc
FOOD MACHINERY AND CHEMICAL CORPORATION

Putting Ideas to Work

FOOD MACHINERY AND CHEMICAL CORPORATION

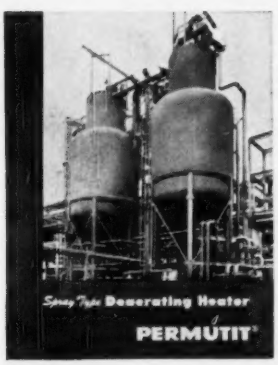
Mineral Products Division

General Sales Offices:
161 E. 42nd STREET, NEW YORK 17

Build your FLUIDICS* library

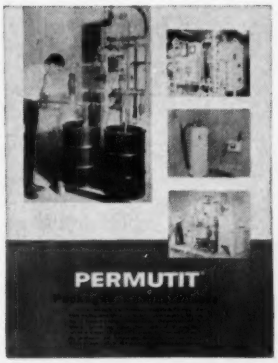
Automatic valveless gravity filter: Costs up to 45% less than conventional filters. Also saves money after installation, because it operates automatically without a single valve, agitator, pump, flow controller, or even an attendant operator. **Bulletin 4351.**

Permutit® Precipitator: Saves about 50% in ground space, 50%-75% in time of treatment, and 10%-40% in certain chemicals and adsorbents, compared to conventional reaction and settling tank. Complete facts on operation and application. **Bulletin 2204C.**



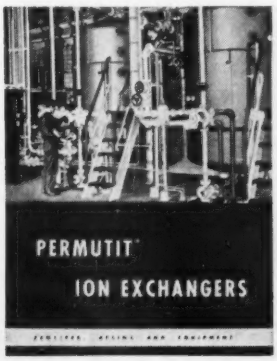
Deaerating Heaters: Designed for removal of carbon dioxide and oxygen from boiler feedwater. Permutit offers both Spray Deaerators, **Bulletin 2357** and Tray Deaerators, **Bulletin 4732.**

Water treatment chemicals: Permutit offers an extensive line of specialized chemicals. Typical data available: **Bulletin CS-105** on Wisprofloc-20 Coagulant Aid, **Bulletin CS-111** on Neutralizing Amines, **Bulletin CS-110** on the Permutit Briquet System.

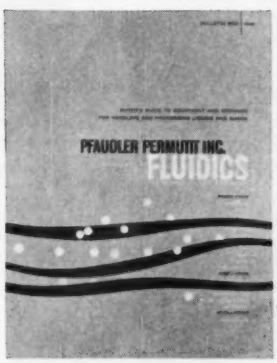


Standard packaged demineralizers: Factory-assembled, systems ready to connect and operate. For summary of applications, plus data on mixed-bed, two-step, non-regenerable and skid-mounted units, send for **Bulletin 4721.**

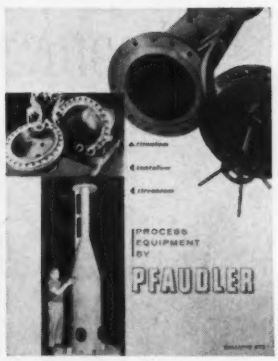
High-capacity water softening: New Permutit® Model BD Softeners answer need for more soft water at lower cost. Details on operation, specifications and performance are in **Bulletin 4696.** Industrial water softening with Permutit automatic equipment, Multiport Valve,® cation exchange, (zeolite) sodium cycle, systems and operation is described in **Bulletin 2386.**



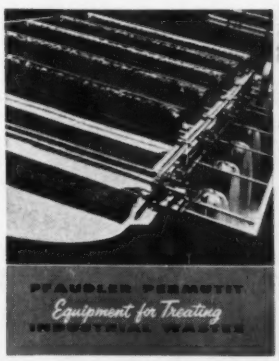
Ion exchangers: From Permutit—the only company to manufacture ion exchange resins and the equipment in which they are used—you can get a brief manual on use of ion exchange as a unit process for purification, recovery, addition, separation, concentration. **Bulletin 2508** covers Permutit resins and equipment.



How FLUIDICS works for you: Buyer's Guide surveys equipment for water and waste treatment, ion exchange, gas analysis, metering and control. Also equipment for handling corrosives, heat transfer, reactions, centrifuging and packaging. Send for **Bulletin 992.**



"New" metals for processing: Tantalum, titanium and zirconium are finding increased use, because of their exceptional corrosion resistance and strength. Corrosion, heat transfer and general application data on these metals, plus equipment available, are discussed in **Bulletin 978.**



Treating industrial wastes: **Bulletin 4486** discusses types of industrial waste problems, equipment used, typical waste treatment systems.

*FLUIDICS is the Pfaudler Permutit program that integrates knowledge, equipment and experience in solving problems involving fluids.

PFAUDLER PERMUTIT INC.

Permutit Div., Dept. CW-100 W. 44th Street, New York 36, N.Y.

Please send me the following bulletins:

- ☐ 4696 Permutit BD Model Softener
- ☐ 2386 Zeolite Water Softeners
- ☐ 4721 Permutit Packaged Demineralizers
- ☐ 4351 Permutit Automatic Valveless Gravity Filter
- ☐ 2508 Permutit Ion Exchangers
- ☐ 2204C Permutit® Precipitator
- ☐ CS-105 Permutit Wisprofloc-20 Coagulant Aid
- ☐ CS-111 Permutit Neutralizing Amines
- ☐ CS-110 Permutit Briquet System
- ☐ 978 Process Equipment by Pfaudler
- ☐ 992 FLUIDICS Buyer's Guide
- ☐ 4486 Equipment for Treating Industrial Wastes
- ☐ 2357 Permutit Spray Deaerators
- ☐ 4732 Permutit Tray Deaerators

Name.....Title.....

Company.....

Address.....

City.....Zone.....State.....

Improve your dishwashing compound with **Blockson Trisodium Phosphate Chlorinated**

■ TSP Chlorinated boosts your dish-detergent's cleaning power, speeds removal of grease and fats. It's buffered for optimum pH, detergency and solution stability. Gives dishes, glasses, flatware a free rinsing sparkle. Destains and bleaches, too! Its chlorine is readily available. At all Blockson jobbers. WRITE FOR DATA BULLETIN, SAMPLE.

PRIVATE LABELERS: As a sanitizing-disinfectant for DAIRIES, BREWERIES, CANNERIES, etc.—TSP Chlorinated is one of the steadiest repeat sellers in the chemicals field. Write for Special Bulletin on *private labeling and registration* required by U. S. Dept. of Agriculture.

BLOCKSON

BLOCKSON CHEMICAL COMPANY

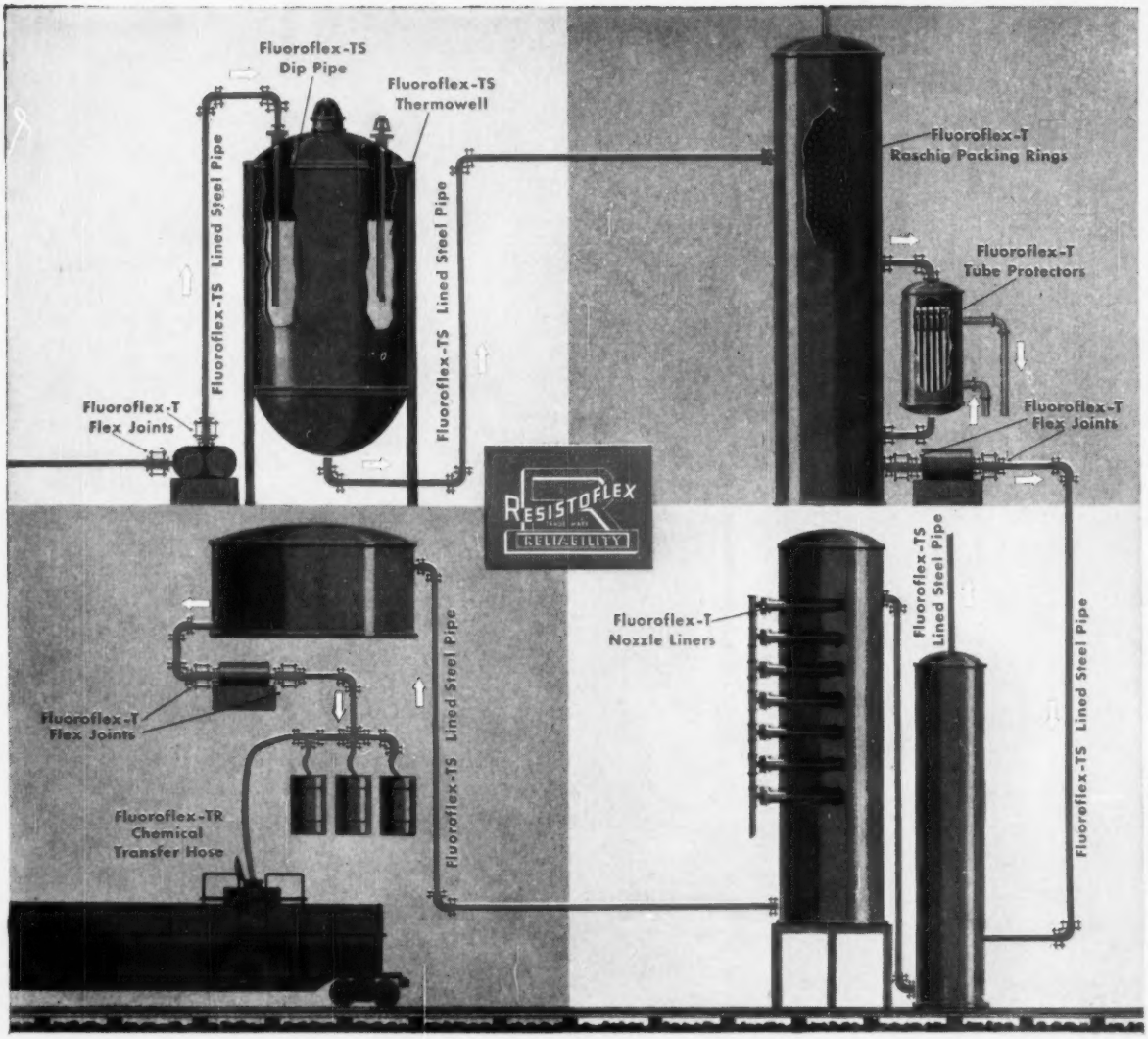
Chemicals Division

Olin Mathieson Chemical Corp.

Joliet, Ill.

In commercial dishwashers... steps up grease removal. Speeds cleaning cycle. Releases chlorine rapidly.

In home dishwashers... imparts free rinsing sparkle. Substantially boosts cleaning power.



HERE'S WHY corrosion-proof fluid-handling components of FLUOROFLEX-T (TEFLON) assure production savings, non-contamination:

Fluoroflex®-T Piping Products as shown above can be used with complete and proven assurance that they will not corrode or build up solids which can contaminate sensitive products. Specially processed of Teflon® resins by patented Resistoflex methods, they can handle the most difficult materials up to 500°F. They are completely resistant to any chemical except high-temperature fluorine and the molten alkali metals.

Fluoroflex-T Piping costs no more on an installed-cost basis than other corrosion-proof systems in common use today. Initial material costs have been lowered by recent price reductions made possible by advanced technology and increasing volume. Installation costs are inherently low as a result of skillful design which features easily-bolted-together units with prefabricated, flanged sections.

Fluoroflex-T Piping costs LESS on a performance basis. Savings in operation are assured—with decreased maintenance, long service life, and the elimination of process headaches and downtime.

So, if *you* have problems of corrosion—want to reduce maintenance or replacement costs and eliminate process downtime or product loss—consult Resistoflex. Write for more information today.

RESISTOFLEX
CORPORATION

Complete systems for corrosive service

Plants **in Roseland, N. J. • Anaheim, Calif. • Dallas, Tex.**
Sales Offices **in major cities**

®Fluoroflex is a Resistoflex trademark, reg. U. S. Pat. Off.
®Teflon is DuPont's trademark for TFE fluorocarbon resins.

Formaldehyde grew up

Old-fashioned, simple formalin was good enough for junior frog-collectors. But modern industry, with its two-billion-pound a year appetite, needs far more sophisticated forms of formaldehyde—*many* developed, *all* produced by Celanese.

There is now a big family of Celanese formaldehydes, designed exactly to fit the requirements of special industries. There's stabilized formaldehyde (formalin 37%), paraformaldehyde (solid polymer) both flake and powder, Formcel solutions (formaldehyde in specified alcohols) and trioxane (anhydrous.)

Celanese scientists *know* formaldehyde. They've discovered, for example, a new and better way to stabilize it, and conquer the troublesome problems of formaldehyde in water solutions. It means shipments at cooler temperatures with process and economic advantages for users.

Celanese is one of the world's largest, most experienced producers of formaldehyde and other high-volume basic chemicals. For technical data, please write outlining your specific interest. Celanese Chemical Company, Dept. 752-J, 180 Madison Avenue, New York 16, N.Y. Celanese® Formcel®

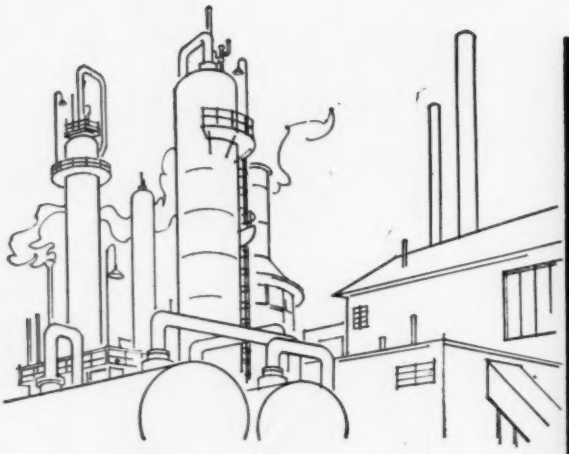
at Celanese

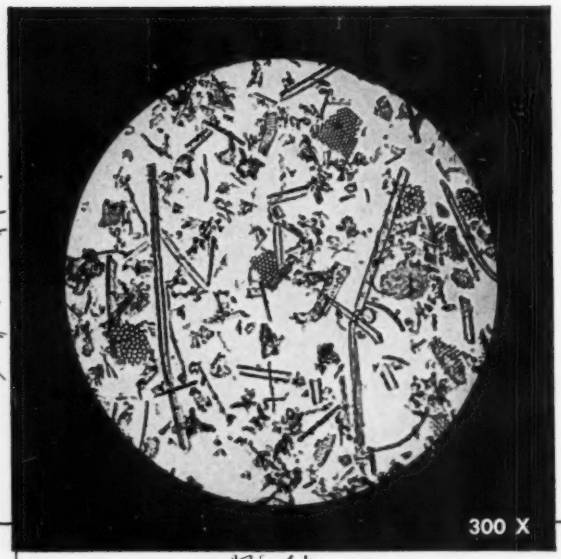
STABILIZED FORMALDEHYDE
PARAFORMALDEHYDE
FORMCEL SOLUTIONS
TRIOXANE

...only Celanese offers all four

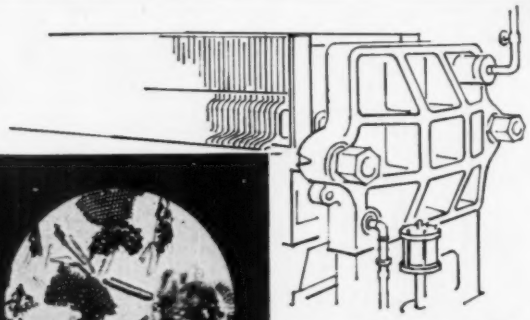
Celanese
CHEMICALS

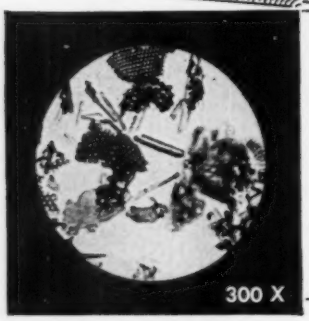
Celanese Chemical Company is a Division of Celanese Corporation of America.
Canadian Affiliate: Canadian Chemical Company Limited, Montreal, Toronto, Vancouver.
Export Sales: Amcel Co., Inc., and Pan Amcel Co., Inc., 180 Madison Avenue, New York 16.



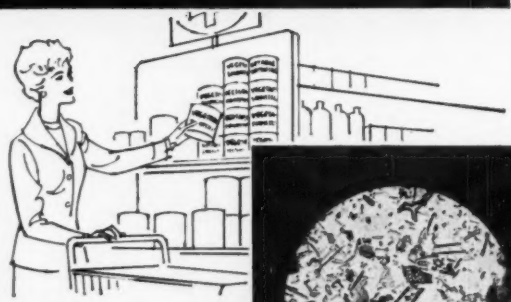


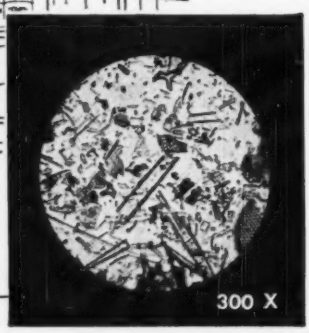
For flow rate plus clarity—Hyflo Super-Cel has the right combination of large and fine particles. Heavily used in chemical processes such as caustic soda production.





For fast flow rates—Celite 545 has a higher proportion of coarse particles. Frequently used for clarification of resins and other viscous liquids.





For maximum clarity—Filter-Cel has a relatively fine particle size distribution. Used in producing lard, salad oil, other hydrogenated oil products.

In diatomites, Johns-Manville precision processing works for you

Celite has the exact grade for every filtration need from fast flow rate to maximum clarity

Study samples of various filtration grades of Celite* diatomite with the unaided eye. Rub them between your fingers. One grade looks, feels very much like another.

Then compare these grades under the microscope. Each has its own distinctive particle size distribution. Each is precision-milled to fill the most exacting filtration requirements, ranging all the way from maximum flow rate to maximum clarity.

Celite 545, for example, with a higher proportion of large to fine particles, is used to remove large suspended impurities at maximum flow rates. *Hyflo Super-Cel®* has a balanced particle size distribution, combines good liquid clarity and moderate flow rate. But *Filter-Cel®* has a much higher ratio of small particles, is tailored for use where high clarity outweighs flow rate.

Whatever your filtration problem—Johns-Manville can furnish the "right" grade for the job. You have a choice of 9 intermediate grades *plus* many special grades. Each comes from the largest and purest commercially available deposit. Each is processed and graded at the same plant under the same uniform conditions.

For information on specific filtration or mineral filler problems, talk to your nearby Celite engineer, or write to us. Johns-Manville, Box 14, N. Y. 16, N. Y. In Canada, Port Credit, Ont.

*Celite is Johns-Manville's registered trademark for its diatomaceous silica products

JOHNS-MANVILLE JM PRODUCTS

Task-Designed Crown aerosol cans contain the help for many a minor cut, scratch and scrape! And a whole new market arrived, thanks to aerosol cans that have been specially Task-Designed by Crown to package a wide variety of products. Aerosol-packed spray bandage is just one of hundreds of new products that gain consumer interest from Crown's pioneering, skill, wide experience and Task-Designing in this new field. May we have the opportunity to provide you with more details?

CROWN *for cans · crowns · closures · machinery*
CROWN CORK & SEAL CO., INC., 9300 Ashton Rd., Philadelphia 36, Pa.

PERFECT FOR LATEX PAINTS

Makon 10 is a nonyl phenoxy polyoxyethylene ethanol offering excellent detergency, foaming, dispersing, emulsifying and solubilizing action. It will not hydrolyze in aqueous solutions of alkalis or acids. It can be used with anionic, cationic or other non-ionic agents. Makon 10 is effective in hard or soft water, as it does not form salts with metallic ions and is also unaffected by oxidizing or reducing agents.

STEPAN makon 10

SPECIFICATIONS

Physical State:	Clear viscous liquid
Color:	Pale yellow to colorless
Cloud Point of 1% Solution in Water:	52°—56°C
pH (1% solution):	Neutral
Solidification Point (°C):	4°
Flash Point (°C):	290°
Fire Point (°C):	330°
Density:	8.85 lbs. per gallon
Specific Gravity (25°C):	1.06

Send Coupon for Further Information and Sample

STEPAN CHEMICAL COMPANY

Edens & Winnetka, Northfield, Illinois
Telephone: **HI**llcrest 6-6306

America's Most Complete Line of Surfactants—Make Stepan your "SHQ" (surfactant headquarters)

Stepan Chemical Company CW-10-C
Edens & Winnetka, Northfield, Illinois

Gentlemen: Please send me
☐ Sample of Makon 10
☐ Technical Bulletin on Makon 10

Name _____

Firm _____

Street Address _____

City _____ Zone _____ State _____

Business
Newsletter

CHEMICAL WEEK
October 22, 1960

On the whole, chemical sales are holding strong; but third-quarter earnings may not measure up to the industry's total for the corresponding period in '59.

Prime example: Du Pont, with third-quarter sales down 2%, to $532 million; and third-quarter operating income down an estimated 15%. In the nine months to Sept. 30, physical sales volume was up 4%; dollar volume was up 1%, to $1,629 million (new record); and net operating income was down about 12%, to $4.38/share.

In the first quarter of its 1960-61 fiscal year, Dow boosted sales 5.4%, to $202.1 million, but earnings dropped 17.1%, to $18.5 million.

One exception to the lower earnings trend: Hercules Powder. With nine-month sales up 18.5%, to $249.3 million, net income rose about 14%, to $2.36/share.

Pfizer estimates third-quarter sales up 2-3%, with profits holding steady. Eastman reports higher sales of chemicals, plastics and fibers from both its Tennessee and Texas outposts. Delhi-Taylor Oil says petrochemical sales during the nine months to Sept. 30 were up 10%.

•

Armour & Co. is pouring $60 million into an expansion program that will nearly triple its current production of fertilizer basics. With these nitrogen and phosphate expansions, Armour's chemical divisions will outrank its slaughterhouse and meat-producing facilities in terms of money invested.

The proposed Sheffield, Ala., nitrogen plant will have these daily capacities: 360 tons of anhydrous ammonia, 300 tons of nitric acid, 240 tons of nitrogen solutions, 50 tons of urea, 250 tons of prilled ammonium nitrate—also ammonium and diammonium phosphates. A phosphate plant, soon to be built near Fort Meade, Fla., will extract and process 700,000-800,000 tons/year of phosphate rock, also produce phosphoric acid, triple superphosphate and sulfuric acid.

•

Food Machinery and Chemical has picked a new president to succeed Ernest Hart, who recently retired. Moving up: James M. Hait, 54, formerly executive vice-president and director of engineering.

•

Monochem is about to pick a site for its $50-million plant. The Borden-U.S. Rubber joint venture for acetylene and vinyl chloride next week will choose one of "several" Gulf Coast sites.

•

Still another benzene-from-petroleum project: Phillips Petroleum will construct a high-purity benzene plant at its Sweeny refinery south of Houston, Tex. Capacity: 22 million gal./year. Phillips expects benzene shipments to be under way by mid-'61. At the same time, it's looking

toward a March 1, '61, completion date for the LPG plant it's building near Stephenville, Tex. The latter will produce some 50,000 gal./day of propane, butane and natural gasoline and strengthen Phillips' position as a leading LPG producer.

Besides these steps, Phillips has in the past year expanded or is now expanding annual capacities in these fields: synthetic rubber (up 10,000 long tons), ammonia (up 64,800 tons), ammonium nitrate (up 11,300 tons), carbon black (up 60 million lbs.), polyethylene (up 25 million lbs.), *p*-xylene (up 700,000 lbs.), methyl vinyl pyridine (up 1.5 million lbs.), and ethylene (up 285 million lbs.).

•

Monsanto is preparing to take over the 50% share of Chemstrand Corp. owned by American Viscose. It will be Monsanto's most sizable acquisition since '55, when it bought Lion Oil. Chemstrand, a producer of nylon and Acrilan fibers, is now owned jointly by Monsanto and Amvisco and would continue under its present management as a separate entity.

Monsanto now produces acrylonitrile and ammonia—two of the needed raw materials for Chemstrand's operation—and may also be contemplating some captive-production of cyclohexane. Chemstrand buys the cyclohexane, a key raw material for nylon, on the open market.

Another Chemstrand note: it will become Mexico's fourth nylon producer by teaming up with a Mexican group headed by Julio Gonzalez Mora, a leading textile manufacturer. Chemstrand and its partners have formed a new subsidiary and plan to build a plant near Mexico City to produce nylon 6/6 yarns "in a variety of textile and tire deniers." How large the plant will be and how much of each type of yarn it will produce has not been disclosed.

•

Esso may build a polypropylene plant in Sweden: An authoritative source tells *CW* that the deal hinges largely on license negotiations with Montecatini.

•

Cuba has entered the final stages of nationalizing its economy with the seizure of 400 companies last week. Among the 20 U.S. companies grabbed were subsidiaries of Du Pont, Colgate-Palmolive, Procter & Gamble, Sherwin-Williams, Pittsburgh Plate Glass, American Agricultural Chemical.

•

Imperial Chemical Industries will distribute Syntex hormone products throughout the British Commonwealth except in Canada. First product from the Mexican-based steroid producer to be marketed by ICI will be Syntex' new anabolic (tissue builder) Anapolon. The products will carry the Syntex label. And *CW* learns that Syntex will soon report similar deals with French, German and Italian companies, giving it a worldwide marketing network.

From talc-like pulverants . . . to granulars . . .

HAULING VERSATILITY IS THIS BUTLER "P-D" TRAILER'S LONG SUIT

This wonderfully simple pneumatic hauler will unload a vast range of dry flowables with unusual efficiency. It's called Butler "P-D" (for pressure differential) and it absolutely thrives on hard-to-handle loads. You get fast, positive, 100 per cent clean-out every time. No special receiving equipment is needed . . . for either horizontal or vertical delivery.

Moreover, your shipments deliver worry-free in a Butler Pneumatic Trailer. The cylindrical shape saves weight, and it's the sturdiest and safest design yet developed for a pressure vessel. Careful automatic welding eliminates stress. Code and ICC safety factors are incorporated. And with no interior belts or liners to wear out, costly downtime is minimized.

Cement . . . plastic pellets . . . fertilizer . . . fly-ash . . . whatever you handle . . . it will pay you dividends to go bulk with Butler. We will be glad to advise you if your product can be readily delivered in a "P-D" trailer. And Butler also provides a full line of high-quality steel and aluminum transports for liquid hauling needs. Write direct to the Butler office nearest you for details.

CELEBRATING 60 YEARS BUTLER FABRICATING METALS

BUTLER MANUFACTURING COMPANY

7459 East 13th Street, Kansas City 26, Missouri • 959 Sixth Avenue, S.E., Minneapolis 14, Minnesota

Manufacturers of Equipment for Transportation, Bulk Storage, Farming, Outdoor Advertising • Metal Buildings • Plastic Panels • Contract Manufacturing
Factories at Kansas City, Mo. • Minneapolis, Minn. • Galesburg, Ill. • Richmond, Calif. • Birmingham, Ala. • Houston, Tex. • Burlington, Ontario, Canada

"Dad, where did I come from?"

"You came from Chase, son, and a lucky little chemical bag you are! Nobody knows more about bag materials and bagmaking than Chase. Chase makes its chemical bags of paper, textile, and polyethylene, or combinations of these materials. Every material is tested to assure maximum strength, minimum bulk, superlative moisture protection and lowest cost. And Chase engineers are continually solving packaging problems for the chemical industry. That's why you can now number among your relations a new, superstrong Chase Bag that permits safe storage of hygroscopic chemicals, even outdoors, for months... in any weather. Doesn't it all make you just glow with pride, son?"

Feel an idea coming on? Call your Chase Man. Or a letter direct to us will bring complete facts about economical Chase packaging for any chemical product—even some semi-liquids.

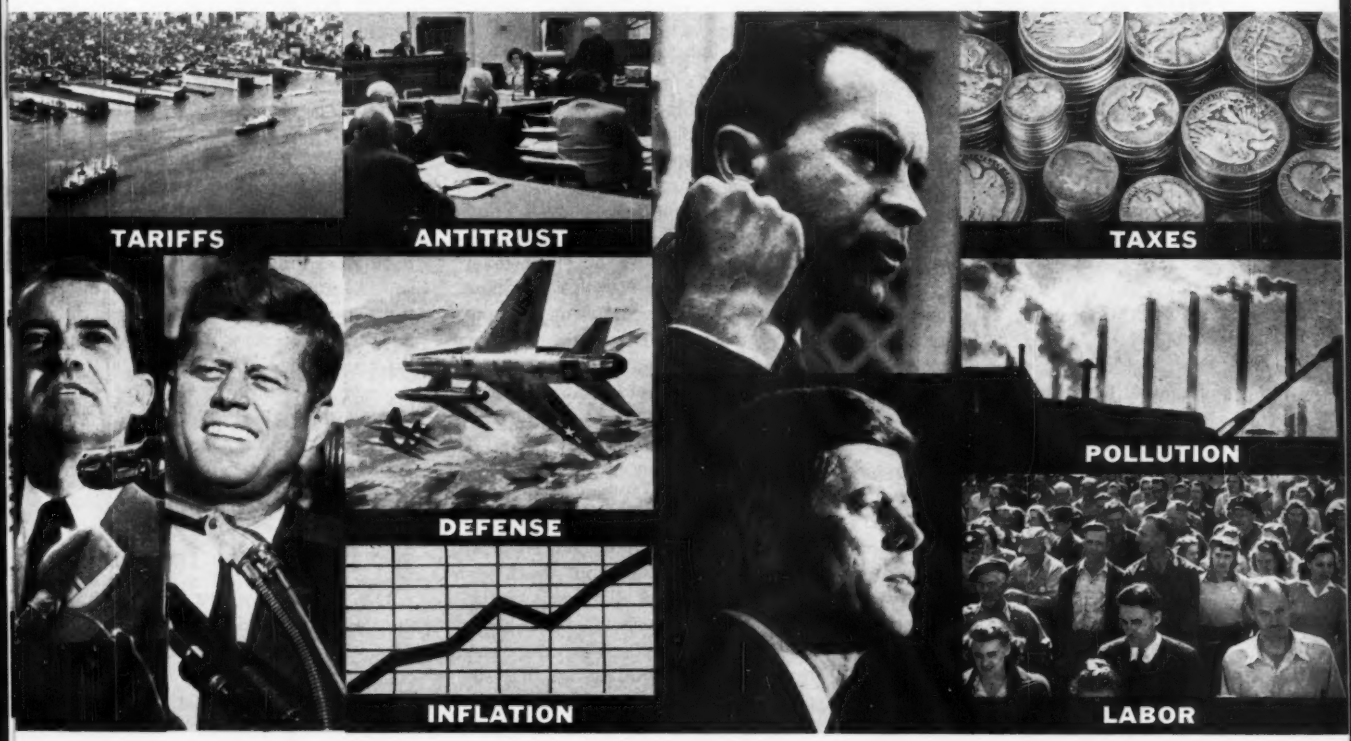
CHASE BAG COMPANY

355 Lexington Avenue - New York 17, N.Y.
32 Plants and Sales Offices Coast to Coast

MULTIWALLS • HEAVY-DUTY POLYETHYLENE • LAMINATED AND TEXTILE BAGS AND OTHER PACKAGING MATERIALS

Chemical Week — October 22, 1960

The Issues: Nixon vs. Kennedy—and 'Business as Usual'



The CPI Talks Politics—But Softly

Dozens of top industry executives —interviewed by Chemical Week in many parts of the country last week—are showing a keen awareness of big issues in the electoral contest: taxes, inflation, defense expenditures, foreign affairs and national security, unemployment and rate of economic growth, aid for education, old-age medical care, and government-business relations. But most of these management men are unimpassioned about the campaign—at least right now.

Their couldn't-care-less attitude stems from either or both of two principal reasons: (1) diplomacy—a "big business" endorsement might be the "kiss of death" for a preferred candidate, and regardless of who wins the election, government contracts might come in handy during the next four years; (2) dissatisfaction with both of the candidates.

One new trend: a sharply heightened interest in international relations. Many executives regard this as the overriding issue in the campaign. Greatly increased activity on the part of U.S. chemical companies in overseas business is undoubtedly a factor, although the industry has always been concerned with world trade and tariffs.

One company president ("I was born a Democrat, but have voted for Republicans") cites the fact that the economies of most countries are now interdependent. He wants a fast-expanding U.S. economy plus care taken with foreign policy. Many other executives ascribe prime importance to the international situation, believe Nixon is the man to handle it. One, citing Vice-Presidential candidate Lodge's experience in the field, thinks that Lodge would be given general control over foreign policy in the Administration.

Many chemical management men find little difference between Kennedy and Nixon. "I can barely tell one candidate's views from another without a program," says one.

Generally light campaign interest among executives is not reflected in the chemical labor force. The AFL-CIO Chemical Workers Union has firmly endorsed the Democratic ticket, is striving to arouse enthusiasm among the membership. Asked why his company is actively encouraging everybody to get out and vote, a vice-president of a major chemical firm replied: "We figure that about 80% of the workers are already steamed up by the unions—they're the ones who are going to vote anyway. If we can get out the other 20%, they may vote our way."

Most companies have campaigns to encourage workers to vote, even though few executives are willing to

take an open stand themselves. But W. J. Nolte, Jr., vice-president of Consolidated Paper Box Mfg. Co. (Richmond, Va.), has stated publicly that "business management should go on record with its employees concerning its stand on the political, social and economic issues of this Presidential election." Nolte has notified employees that management favors the Republican ticket.

One Midwestern company head encourages the firm's hourly paid employees to vote for whom they choose but encourages management people to vote for (and contribute to) the Republican party. This is done subtly, but not so that the message can be missed. (Copies of Senator Goldwater's book have been circulated.) One high-ranking executive of this company, however, wears a Kennedy button.

One plant manager in the South says he has a Nixon sticker on his car. "The workers see that sticker on my car and they know how I feel. But there are no threats or coercion here," he says.

Aerojet-General — starting with $5,000 contributions to their parties by both the Democratic president and Republican executive vice-president —has set up an in-plant campaign donation collection system. Others have made similar arrangements. Some Southern companies have arranged for qualified people on the payroll to accept poll taxes and register voters in the plant. One company, which issues contribution envelopes addressed to local headquarters of either party, reports that more Republican than Democratic envelopes have been taken.

Not all company efforts in the political area are tied to the elections. Standard Oil of California, Minnesota Mining and Mfg., Standard Oil of New Jersey, among others, have shown to employees a film made by Fulton Lewis III that purports to prove that demonstrations against the House Un-American Activities Committee in San Francisco last May were Communist-inspired. Some employees, especially among research groups, are reported to be bitter about the showings, and the companies are reluctant to discuss the matter.

Many executives, in fact, are reluctant to talk about the campaign at all—even privately. Most are involved one way or another in defense contracts and feel that the election will be very close. A strong pro-Republican statement, it is feared, could be held against them if the Democrats prevail.

Another factor is uncertainty as to what a big-business endorsement might do to a favorite candidate's chances. In Illinois, for example, companies are reluctant to discuss their political preferences for fear that Sen. Paul Douglas, running for re-election and disliked by most business interests, might use business opposition in support of his case for the "little man."

Others have no such inhibitions. Says one Southern chemical company president: "All of the members of my family down through the years have been Democrats, but I cannot bring myself to vote for Kennedy. I don't like the Republican party, its platform, or Nixon, but it is the lesser of the two evils. The Republicans will at least give the businessman a little free air—he'll be able to open his morning mail without the advice and consent of 89 different agencies. If the Democrats should be in power for as long as the next 20 years, there would be no private industry at the end of that period."

Such extreme views are balanced by more moderate endorsements of the GOP, mainly stating that "a better business climate would then be established."

When it comes to specific issues, a majority believes there isn't much to choose between. Most cite such things as increased government spending, higher taxes, inflation, stifling of individual initiative, a growing centralization of the government, and inadequate control of labor as being the things to fear from the Democratic party. Most were happy with the Eisenhower administration (except for sharp disagreement on his international policies) and desired more of the same.

Few executives report that the elections are influencing their decisions. Only one reported a hold-back on planning until after the election. A fertilizer company executive said some new products were being delayed awaiting the announcement of the new secretaries of Agriculture and Health, Education and Welfare. Pending issues in the farm and food additives programs could make a difference. Another fertilizer manufacturer exclaims: "If I knew what either Kennedy's or Nixon's farm program was, we'd be darned interested."

One Midwestern executive says he is for Nixon because "he's a man who has had to go out and earn a buck and knows the value of a buck." Another is for Kennedy because he feels that the important thing is to have a faster-expanding economy: "The only people who care about a sound dollar are those who've already got it made; we who are out to get a buck want things to keep moving upward." Another concedes: "No matter who wins, the government will have to take care of people who can't take care of themselves. That's the way the times are." The most general feeling seemed to reflect the statement: "Industry has to accommodate itself to any situation. We will be doing business as usual."

No Fret Over Imports

U.S. industry may be worried about the impact of foreign competition on domestic business, but it has failed to communicate its fears to its own workers. This is the gist of a report given by a labor relations expert last week to the Synthetic Organic Chemical Manufacturers Assn.'s third annual seminar on tariff and customs matters.

The consultant—John Perry, vice-president of Fred Rudge Associates—based his conclusions on two surveys his organization conducted in August and September. They covered interviews with about 500 factory workers.

Most of these workers believe that business in general will be at least as good in the '60s as it has been over the last decade. They are somewhat less optimistic about employment prospects, but the pessimists are still in the minority. Where workers are worried, automation—not imports —is their principal cause of concern, except in the textile industry. Only one out of seven workers queried believe that foreign competition will hurt their job prospects in the '60s. An equal proportion think imports will actually improve the job picture. The rest don't look for foreign competition to have an effect one way or the other.

Limits for Lipsticks

A set of temporary tolerances for one-time-banned coal-tar colors in lipsticks was established last week by the Food & Drug Administration. The move should allow cosmetics makers to operate without significant change or hardship, and apparently ends an extended threat to the cosmetics industry.

The new tolerances—6% by weight of coal-tar dyes in lipstick—were established under the color additives law enacted last July. Unlike the law it amended, the new regulation permits limited use of colorants that may be harmful in large amounts (*CW Washington Newsletter, July 23*). The 6% limitations are temporary tolerances—arrived at on the basis of just-completed subacute toxicity tests on animals—and they will stay in effect until more extensive tests can be completed to provide a more accurate basis for setting limits. They apply to 11 of the 13 colors previously banned by FDA (*CW, June 25, p. 27*).

Color Guard: Wholly external uses —as in rouge and face powder applications—may contain all 13 of the coal-tar dyes with no restrictions, FDA said.

At the same time it okayed the dyes for lipsticks, FDA authorized five colors for use in mouthwashes, dentifrices and drugs. Basis for this ruling: no more than 0.75 mg. of dye in whatever quantity of a given product that can be reasonably expected to be ingested by a human in a day. And the new regulations extend a ban on two soluble yellow dyes containing β-naphthylamine, a known carcinogen. Both were previously banned in food and drugs, and industry has largely abandoned them in their major cosmetic use, hair dressings.

Adjustment Time: While the 6% tolerance is slightly less than some industry spokesmen had asked for, one FDA technical expert believes that industry will be able to adjust to it without difficulty. He said that some "reformulation" might be necessary with a few lipstick shades, however. The order is effective immediately, but batches of color already certified can be used up.

Under the July color additives act, FDA must complete tests within a 2½-year transition period to establish "safe" limitations for the colors. The agency says, however, that it would be an impossible task for it to carry out all of the required testing within the allotted period. With this confrontation, FDA has called for an Oct. 21 conference with industry leaders to discuss possible solutions of the testing dilemma.

Purex Buys Turco

Purex Corp. (South Gate, Calif.) is expanding its line of industrial cleaning products with the purchase of Turco Products (Los Angeles). The acquisition, according to Purex President A. C. Stoneman, "will strengthen Purex' position in the industrial cleaner field by adding chemical specialty products not now sold by Purex." Most of Purex' products are for household use.

Turco—acquired for $2 million in cash and $3.5 million in subordinated notes—manufactures industrial cleaners and is the licensing agent for eight patents on chemical milling processes owned by North American Aviation. Besides its facilities in Los Angeles, Turco has plants in Houston, Rockdale, Ill., and on Okinawa, plus interests in plants in Rotterdam, London, Paris and Heidelberg and a subsidiary in Switzerland.

In the year ended last June 30, Purex sales were up 11%, to $79.6 million; earnings increased 19%, to $3.3 million over last year's net.

Attack on Exhausts

A firm step toward commercialization of an effective and economical automotive exhaust purifying device was made last week in an agreement between Universal Oil Products (Des Plaines, Ill.) and Arvin Industries (Columbus, Ind.). The firms have agreed to exchange technical information and to cooperate in testing catalytic devices for reducing exhaust gases. Both had been independently doing research in this area.

Their agreement is expected to accelerate certification and large-scale production of automobile exhaust control systems.

UOP has already developed a catalytic muffler — Purzaust — and Arvin has conducted an exhaust catalyst research program in connection with Battelle Memorial Institute during the past two years.

Pipeline in a Pinch

Opposition is mounting to Foothills Pipe Lines' proposal to build a 1,244-mile Alberta-to-Chicago pipeline for inexpensive exportation of natural gas by-products into the U.S. (CW, June 4, p. 21).

During a four-day hearing before the Alberta Oil and Gas Conservation Board, two Canadian petrochemical companies—Canadian Industries Ltd. and Canadian Chemical Co.—formally lodged their protests. The common theme: wide-scale export of the natural gas liquids could have a serious effect on supply and price of liquefied petroleum gas in the Canadian province.

The permit that Foothills, a Pembina Pipe Line subsidiary, seeks would be for a 25-year period starting in '62. It would allow a daily maximum of 11,000 bbls. of propane, 14,000 bbls. of butane and 43,000 bbls. of condensate to be removed from Alberta. The proposed 16-in. pipeline, however, has been designed to handle considerably larger volumes to take advantage of the estimated 146,700-bbls./day surplus forecast for '72.

Apparent purpose of the application: to put Foothills in a position to seek long-term commitments from prospective U.S. purchasers. Three other companies—rivals also wanting to build pipelines—have similar permits before the board and intervened at the Foothills hearing.

CIL told the board that it was concerned "whether this scheme [of Foothills] is likely to be compatible with an adequate supply of raw materials within the province, which the rapidly expanding petrochemical industry requires."

Both protesting chemical companies presented sharply rising consumption figures on the fuel gas requirements of their polyethylene operations. At the same time, they cited additional factors that might increase future consumption still more.

Pembina Pipe Line expects to acquire an unidentified marketing "group" in the Chicago area as a full and equal partner in the Foothills project. With a Canada-U.S. pipeline—if this or any other similar application is approved—petrochemical plants seem sure to be in the offing for the Great Lakes area as a valuable raw material becomes available.

Japan Eases Up

Du Pont's success in setting up a joint neoprene venture with Showa Denka in Japan apparently marks progress in Japan's program to liberalize its investment and trade policies.

The Japanese government has finally decided to approve the 50-50 venture—the first time in several years that Japan has allowed a foreign investor to hold more than a minority share of a Japanese firm. Many U.S. companies are hoping that the move will set a precedent.

The new subsidiary, Showa Neoprene, is capitalized at $9.7 million, and is slated to produce 8,000 tons/-year at Kawasaki. To increase production beyond that rate the company would need further government approval. The government's Ministry of International Trade and Industry (MITI) estimates Japanese neoprene demand will be 12,000-13,000 tons in '63, and it wants to reserve 4,000-5,000 tons for Japanese producers.

The new company will have a Japanese president and a U.S. vice-president. The number of directors and auditors will be split evenly between the parents.

MITI doesn't want its approval of the Du Pont venture to be considered a precedent. The deal was reportedly permitted simply because it was the only way to bring in foreign neoprene technology. Nevertheless, some industry observers expect "a landslide" of similar deals to be approved, including the long-pending high-pressure-polyethylene ventures between Mitsui Petrochemical and Du Pont, Mitsubishi Petrochemical and Badische Anilin- & Soda-Fabrik, Sumitomo and ICI, and Nitto Chemical and Union Carbide.

Patent Problems: The birth of another phase of Japan's polyolefin industry—its polypropylene manufacturing—has become entangled in a conflict over patents. Montecatini last week filed a patent suit against Shin Nippon Chisso, charging that the Japanese company's polypropylene production would violate Montecatini's Japanese patent rights. (Chisso says it will file a countersuit "because it is evident that there's no infringement.")

Chisso has slated a 20-25-million lbs./year plant, using technology from AviSun under a royalty agreement. The venture has already won preliminary government approval, but now final go-ahead must await the outcome of the suit.

Montecatini has already licensed Mitsui Chemical and Mitsubishi Petrochemical for two proposed 10,000-tons/year polypropylene plants, both of which have won preliminary government approval. The government is expected to grant approval also to one more plant—probably Sumitomo's proposed polypropylene unit.

Foreign Pulse-Taking

U.S. business investments in overseas operations will be scanned quarterly by a new survey, which focuses on present and near-future outlays. First data show rubber companies and nonferrous metals producers planning to increase their foreign capital expenditures relative to '59, while most other CPI groups are holding back.

The new quarterly study—conducted by the National Industrial Conference Board and financed by *Newsweek* magazine—lists (1) moneys appropriated, and (2) actual expenditures on foreign projects, both on a industry-by-industry basis. It supplements two annual reports in the same general area: (1) McGraw-Hill Survey of Foreign Operations (*CW, Sept. 10, p. 29*); and (2) U.S. Dept. of Commerce Census of U.S. Private Foreign Investment (*CW, Oct. 15, p. 23*).

Over-all, U.S. manufacturing companies polled by NICB increased their first-half '60 capital appropriations for foreign operations by 20%, to $599.9 million. Actual expenditures on foreign projects during the first six months of this year declined 6%, to $365.2 million. By and large, the 140 large manufacturing companies polled by NICB account for possibly 75% of all U.S. industries' overseas investments.

Within the CPI, nonferrous metals producers boosted their foreign capital appropriations during first-half '60 by 377%, to $109 million. Comparative figures for other process industries: rubber products, up 22%, to $44.7 million; chemicals and allied products, down 8%, to $77.2 million; products of petroleum and coal, down 14%, to $183.4 million; pulp and paper products, down 36%, to $9 million; and products of stone, clay and glass, down 86%, to $3 million.

Still Trying in Spain

In the opinion of some, the race to build Spain's first major petrochemical project may be over, but Standard Oil of New Jersey thinks there's still another lap to be run. It's a race that has become a tricky political obstacle course.

Last month Spain's Ministry of Industry turned down two proposals by Esso and Royal Dutch/Shell for large ventures with local partners, leaving the field clear for the $10-million Dow-Unquinesa project and one other—presumably the long-cherished but still-vague venture by the government agency, INI (*CW, Sept. 24, p. 23*).

Now Esso and its prospective partner, Compania Espanola de Petroleos, S.A., have filed an appeal against the ruling. Although the appeal does point out that the ruling seems to violate the government's expressed intention of drawing in foreign capital (since INI still has no known foreign partner), its argument is mainly on economic grounds. It denies the ruling's contention that export prospects are not promising and that the Spanish market isn't ready for more than the two approved projects.

Full capacity of all four proposed projects, the appeal asserts, could be matched by domestic demand by about '68—although INI's precise capacity plans are unknown.

The companies ask that instead of vetoing two projects, the government "coordinate" and approve all of them.

Political Pitch: Esso-Cepsa's hopes probably ride more on political factors than on the speculative economic arguments. They feel that their proposal was handled in an "irregular" manner. In accordance with the law, their original proposition was submitted to the Spanish Presidencia, which was supposed to consult the ministers concerned and make a decision. Instead, the decision came from the Ministry of Industry, with no indication that it had been reviewed by other ministers.

The Ministry of Industry is a champion of INI, but the other ministers are believed to be more in favor of encouraging private enterprise. By sending copies of its appeal to all of the ministers concerned, Esso and Cepsa hope to get more favorable consideration.

COMPANIES

National Distillers and Chemical Corp. (New York) has acquired for an undisclosed amount Minnesota Liquid Fertilizer Co. (Minneapolis), distributor of anhydrous ammonia for direct soil application. MLF will operate as a subsidiary of National's U.S. Industrial Chemicals Co. division, a major producer of anhydrous ammonia. National is also negotiating to acquire Federal Chemical Co. (Louisville), another fertilizer company (*CW Business Newsletter, Sept. 10*).

•

Maumee Chemical Co. (Toledo), industrial chemicals producer, has purchased the Toms River Chemical Corp. (Cincinnati) plant at St. Bernard, O., paying "more than $1 million." Maumee will produce pharmaceuticals, flavors for foods and industrial chemicals there.

•

Michigan Chemical Corp. (St. Louis, Mich.) has acquired the anhydrous hydrogen bromide production facilities of Food Machinery and Chemical Corp.'s Chlor-Alkali Division at South Charleston, W.Va., and has moved them to its Michigan plant.

•

Northern Industrial Chemical Co. (Boston) has acquired the dinnerware molding division of Watertown Mfg. Co. (Watertown, Mass.). The move indicates that NIC will continue to expand its activities in the dinnerware field and that Watertown will concentrate on raw material and custom-molded products.

•

Polystructures, Inc., a Stoneham, Mass., corporation, has been set up to engage in research, development and production of reinforced-plastic and foam-plastic products. It will operate in the areas of encapsulation of electronic components, design and manufacture of radomes and plastic antennas, and plastic-foam dispensing equipment.

EXPANSION

Styrene Plastics: Monsanto Chemical Co.'s Plastics Division (Springfield, Mass.) has begun production of a multimillion-dollar facility at Addyston, O., to produce a new family of styrene-based plastic materials. The new facility, scheduled for completion by late '61, will substantially increase the company's output of heat-resistant and high-impact styrene plastics, and will increase by 25% its domestic production of styrene molding and extrusion materials.

•

Xylenes: Standard Oil Co. of California (San Francisco) will begin construction of a $17-million chemical complex at its Richmond, Calif., refinery (*CW, Oct. 8, p. 38*). The new complex—scheduled for completion by late '61 or early '62—will produce enough *p*-xylene to increase Richmond's annual output by 41 million lbs., and will provide more than 100 million lbs./year of high-purity *o*-xylene.

•

Potassium Nitrate: Jacobs Engineering Co. (Pasadena, Calif.) will provide the complete engineering, design, purchasing and construction management for a $7-million potassium nitrate plant to be built at Vicksburg, Miss., for Southwest Potash Division of American Metal Climax (*CW, July 16, p. 35*). Plant objective: to make potassium nitrate available for the first time in large tonnage at prices in the range of presently used fertilizer ingredients.

•

Silica: National Silica (Melbourne, Ark.)—a Nevada corporation headed by Ray Ossenbeck of Los Angeles—is building a $500,000 silica plant four miles south of Guion, Ark. It will produce 120 tons/day for the glass industry and foundries. Previously, it had been erroneously reported that the plant was being erected by National Silica Co. (Oregon, Ill.), a subsidiary of Manley Sand Co. (Rockton, Ill.).

FOREIGN

Natural Gas, Oil/Russia: The Soviet Union will pipe natural gas from the western Ukraine to a Polish nitrogen fertilizer plant to be completed by '65 in the Pulav District. Russia also has agreed to sell Italy 12 million tons of oil under terms of a $200-million trade pact, which specifies that Russia will deliver 2 million tons within four years. In return, Italian companies will supply Russia with 240,000 tons of steel tubes and oil pipeline equipment, and 50,000 tons of synthetic rubber.

•

Specialty Chemicals/Mexico: Nalco Chemical Co. (Chicago) is putting up a plant at Saltillo to produce water treatment chemicals, metalworking compounds, and industrial corrosion inhibitors. Nalco is also expanding its German subsidiary.

•

Synthetic Rubber/West Germany: Farbenfabriken Bayer is expanding production capacity for several synthetic rubber types, including Perbunan C, which will be increased to 25,000 tons/year. Bayer also intends to start commercial production of polybutadiene and polyisoprene with newly developed stereospecific catalyst systems.

•

Investment Prospects: The Pakistan Industrial Development Corp.'s Natural Gas Fertilizer Factory (Frenchuganj, Sylhet District, East Pakistan) is seeking U.S. capital and technical help for construction of plants to make insecticides, vat dyes, ethyl alcohol, polyethylene, pharmaceuticals, salt from sea water, caustic soda, soda ash, sulfuric acid, and for plants based on sulfuric acid.

CHEMICALS OUTLOOK

October, 1960

This news bulletin about Wyandotte Chemicals services, products, and their applications, is published to help keep you posted. Perhaps you will want to route these and subsequent facts to interested members of your organization. Additional information and trial quantities of Wyandotte products are available upon request . . . may we serve you?

WYANDOTTE TO PRODUCE OXIDE CHEMICALS IN THE EAST

On August 31, Wyandotte broke ground for a new oxide products plant in Washington, New Jersey. The plant is now well along the way to completion, and is expected to go on stream in January of next year.

It will serve as a key source of supply in the East for our large and growing list of polyols made from Wyandotte's ethylene and propylene oxides. These include our Pluronic® block-polymer surfactants, our Pluracol® polyoxyalkylene glycols, and our complete line of urethane-grade polyols. Rail and truck arteries go out from the site to New England, North Atlantic, and Atlantic coast states.

Ample provision has been made for bulk storage of specific liquid polyols, and various mixtures blended to customer specifications. There will also be warehouse facilities for drummed products.

The new plant points up Wyandotte's continuing expansion in the field of oxide chemistry. We have been producing oxide chemicals at our Wyandotte (Michigan) plant for some time, and recently completed the second expansion of capacity there within the past year. And our Geismar (Louisiana) ethylene-oxide plant — which went on stream in March of 1958 — is now firmly established in the South. It has a capacity of 60 million pounds a year.

SEND FOR NEW CHECK-LIST OF URETHANE CHEMICALS

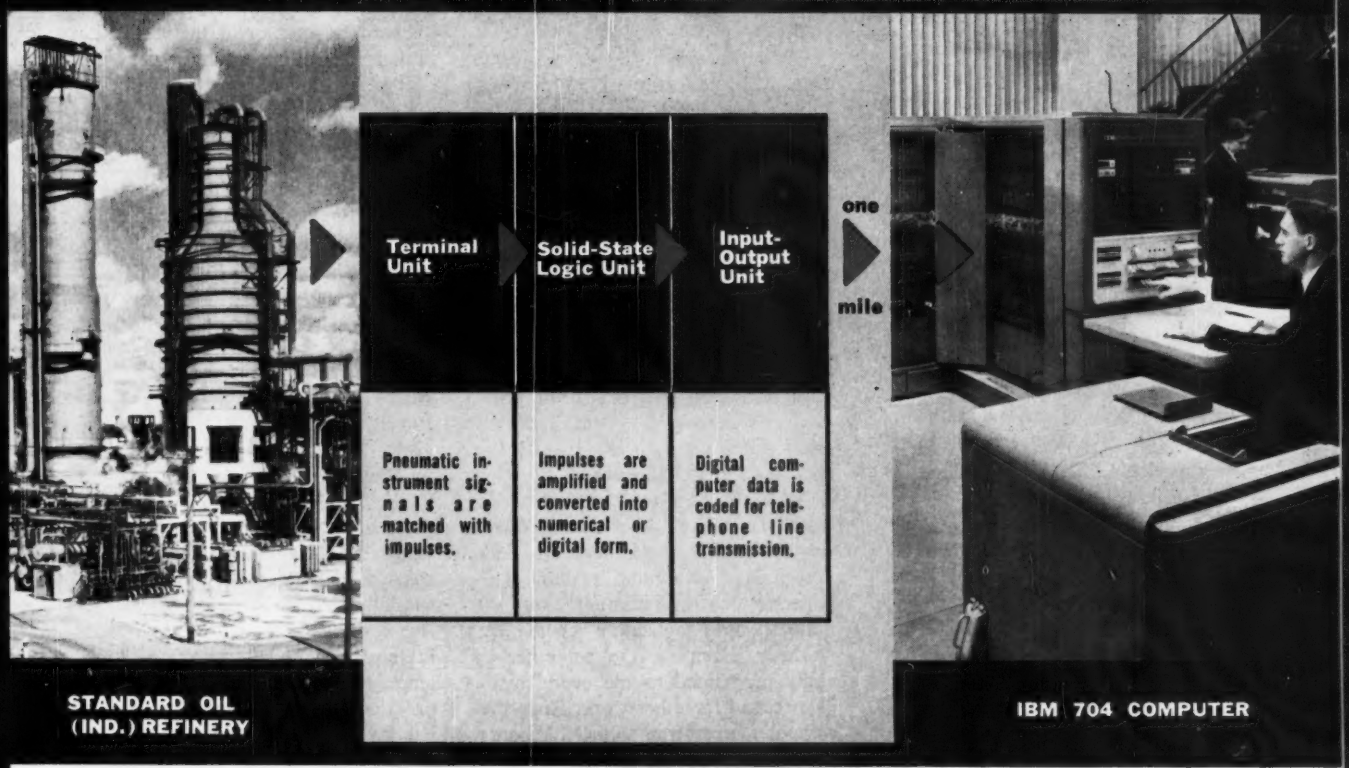
Here's another first from Wyandotte in the field of oxide chemistry. We've prepared a concise, file-size chart that shows at a glance all of our chemicals for urethanes — diols, triols, tetrols, catalysts — and gives the essential facts about each of them. It's designed to free you of the tiresome, time-consuming business of searching through volumes of data for the most basic information about urethane chemicals. Molecular weights, chemical contents, and keys to nomenclature are all included in it. With it, you can find out very quickly whether we have a particular urethane chemical you may need ... a triol, for example, with a specific molecular weight. Write to us for your copy. To assure prompt attention, address your request to Department CO.

Wyandotte CHEMICALS

WYANDOTTE CHEMICALS CORPORATION
WYANDOTTE, MICHIGAN • OFFICES IN PRINCIPAL CITIES

SODA ASH • CAUSTIC SODA • BICARBONATE OF SODA • CALCIUM CARBONATE • CALCIUM CHLORIDE • CHLORINE • GLYCOLS • SODIUM CMC • ETHYLENE OXIDE
ETHYLENE DICHLORIDE • POLYETHYLENE GLYCOLS • PROPYLENE OXIDE • PROPYLENE DICHLORIDE • POLYPROPYLENE GLYCOLS • SURFACE-ACTIVE AGENTS
DICHLORODIMETHYLHYDANTOIN • CHLORINATED SOLVENTS • URETHANE FOAM INTERMEDIATES • DRY ICE • OTHER ORGANIC AND INORGANIC CHEMICALS

Hooking a Digital Computer to a Distillation Unit Lets...


Terminal Unit
Solid-State Logic Unit
Input-Output Unit
one mile
Pneumatic instrument signals are matched with impulses.
Impulses are amplified and converted into numerical or digital form.
Digital computer data is coded for telephone line transmission.
STANDARD OIL (IND.) REFINERY
IBM 704 COMPUTER

General Computers Vie for Plant Control

The diagram (above) tells, in a simplified way, how a general-purpose computer is hooked up to a crude oil still at Standard Oil Co. of Indiana's giant Whiting, Ind., refinery. The first instance of the use of a general-purpose computer in process control, this setup is a big step forward for the computer-conscious petroleum industry, and a happy harbinger for all the chemical process industries.*

Reason: now many CPI firms can look forward to using their already-installed computers for process control, rather than purchase a specially designed computer control system.

Standard Oil of Indiana had a general-purpose IBM 704 doing scientific calculations at Whiting long before any thought was given to computer process control at that plant. So the real question was not which of four alternatives (*see p. 32*) to choose, but rather how to adapt the 704 to process control work.

Standard of Indiana found that the 704 could be hooked up to the process signals by using three specially designed units. Cost of these units, plus the timesaving — the relatively short time that the 704 would require to do the control work—makes such a plan more economical than outright installation of another computer.

The three units have the over-all task of converting process signals into numerical (or digital) form for the computer. First, a terminal unit matches the process signals with electrical impulses. Then these impulses are sent to a solid-state logic unit. Here the 196 inputs (196 instrument readings) are scanned in about 75 seconds. The same logic unit amplifies these signals and converts them into digital form. Finally, this digital information is coded for transmission to the 704 computer—situated about one mile from the control annex in an administration building.

Comparing Costs: All this relay work came to considerable expense. But this expense must be compared with the cost of alternate computer systems.

The Thompson Ramo Wooldridge RW-300, for instance, is the outstanding example of computers designed for process control work. This computer was installed only a year ago at a B. F. Goodrich Chemical Co.'s Calvert City, Ky., vinyl chloride plant. The RW-300 costs $98,000. (An IBM 704 sells for $1.1-3.2 million, rents for $44,000/month.)

Only three years old, the RW-300 has already captured 80% of the computer-controlled processes in existence. Big advantage: closed-loop operation, which means full automation. No

* In which 25 computer control systems (about $5 million worth of hardware) are already in operation.

Choice: Four Systems

The 25 computers now controlling processes are used in four systems. Key feature: how the computer is tied to process instrumentation:

(1) A general-purpose computer connected to a process via specially designed equipment (e.g., the Standard of Indiana-IBM system).

(2) Specially designed computers (e.g., Thompson Ramo Wooldridge RW-300) tied in directly.

(3) Analog computers — e.g., Computer Systems Inc.'s (Monmouth Junction, N.J.) MC-5800 general-purpose analog computer.

(4) Combination analog-digital computers. Process signals pass through an analog computer, then to a digital and back through the analog to the process.

Before selecting a computer control system, three kinds of variables must be defined: primary, constraining, economic variables.

(1) *Primary variables* are not dependent upon any measurable quantities. Examples: flow rates and heat inputs. They can be controlled by a plant operator, or they may be noncontrollable. Among the latter: quality of raw material; weather surrounding the process equipment. The Indiana Standard unit has 100 primary controllable variables; 19 are important for day-to-day control.

(2) *Constraining variables,* or constraints, are restrictions on process operation because of management decisions or limitations in equipment. The Indiana Standard IBM system has about 160 constraints; 59 are important to control.

(3) *Economic variables* must be optimized to assure full utilization of process investment.

Finally, a mathematical model —a series of equations representing process operation—is required. The model's equations manipulate the primary variables. The model takes account of constraints on the process system. Objective: to keep the economic variables satisfied, thus maximize profits, cut costs, or achieve whatever goals management has set.

plant operators are required. But personnel reduction is only a small factor in justifying computer control. Actually, the only significant manpower change is that responsibility shifts from operating staff to maintenance staff.

The big savings in this system come from highly effective use of raw materials—less reprocessing is needed—and from a stabilized reaction. These gains will enable a three- or four-year payout period for the computer system, says Goodrich.

However, this computer is tied to the process. It, like all closed-loop operations, runs 24 hours a day, is not free for any scientific or business work. On the other hand, when a general-purpose computer (e.g., an IBM computer) is linked to the process by an open-loop system, it can be easily interrupted to do any of the normal computer functions.

At Whiting, a total of only four hours/day of computer time is taken up by control work. Process data comes in four-minute intakes; comparisons with the optimum, every 20 minutes; and optimization occurs once an hour. Even so, the computer is easily programed to use every available second for other work. Since the computer runs two shifts, 12 hours are left for scientific and business applications.

This means that the hundreds of process firms that now have general-purpose computers may well consider borrowing some computer time for control work. The only outlay would be for the adaption equipment — in Standard of Indiana's case, the three units noted earlier. The cost of this adaption compares favorably with the purchase of another computer.

By this gambit, the IBM general-purpose computers are, in effect, converted into specially designed computers. But, the big difference is that the 704 is not touched at all. Freed from its process control assignment, this computer still performs its regular functions. On the other hand, the specially designed computers have internal adaptations of the digital computer. They are built to receive process signals. Consequently, they cannot be freed for other work. Indeed, in closed-loop operation they are not free in any sense.

Nevertheless, the fully automated closed loop is attractive to the process industries. In fact, IBM has been able to simulate closed-loop control with the 704. And it anticipates that at Whiting the 704 will be relieved of its control function, and another general-purpose computer, substituted for closed-loop control of the distillation unit and an ultraforming system. But this second digital computer will most likely be far less expensive than the 704. And it will have the capacity to control several other refinery operations. Ultimately, then, general-purpose computers will be used in either open- or closed-loop operation.

Place for Analogs: The analog computer itself is hardly in competition with the general-purpose and specially designed computers. It is much cheaper, simulates process operation and works analogously to a plant operator. But it cannot function as a supervisor.

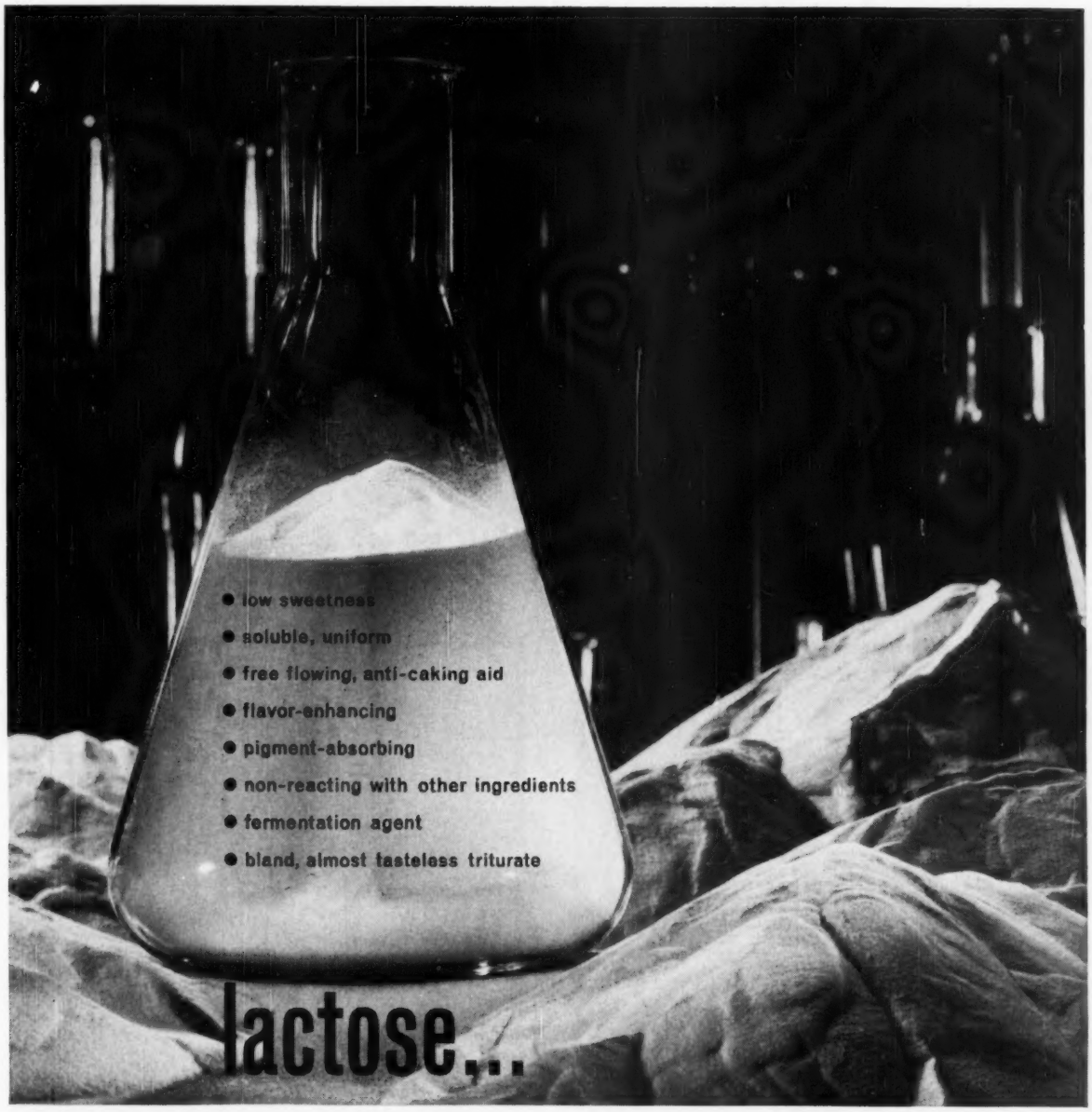
Digital and analog combinations work like this: The analog takes the place of the operator, and the digital takes the place of a supervisor. Result: something quite similar to a specially designed control computer. But again there are several differences in cost, adaptability to operation, amount of data that can be handled, programing methods and over-all capability.

In general, the analog computer is used to study a process and to control only small operations. It is used as a teaching device in many firms and universities.

Final Decision: For computer manufacturers the secret of future success lies in their previous successful installations. Likewise, for process firms, the crux of profitable computer control is a thorough knowledge of their processes. Consequently, the whole field is kept under a closely guarded cloak of secrecy.

Thompson Ramo Wooldridge installed one of its RW-300s in a Monsanto Chemical Co. ammonia plant about a year ago. This plant in Luling, La., will be open for inspection next week.

TRW with its 18 systems now controlling processes throughout the world, has a big jump on other process computer manufacturers. Tally: 12 General Electric Co. (Phoenix, Ariz.) No. 312 computers are in operation; Daystrom Inc. (La Jolla, Calif.) has sold six of its process computers; four Libratrol 500s (made by Librascope



MOST-VERSATILE SUGAR KNOWN

Lactose is an amazing sugar with unlimited uses. It can improve your present products and help you develop new ones. It can lower your costs, simplify your processing. New uses are being discovered for it every day.

Only Western can supply you with all forms of Lactose—five grades, ten granulations. Strict chemical and bacteriological specifications and a rigid quality control program assure highest quality.

Take a fresh look at the characteristics of Lactose. One of the grades or granulations may help solve a problem you are working on right now. For free samples and information, write our Technical Service, Department 20D. (Tell us the applications you are considering.)

Foremost

Lactose

WESTERN CONDENSING COMPANY

Appleton, Wisconsin

World's Largest Producer of Lactose-Pure Milk Sugar

Distributed Nationally by Chemical Department, McKESSON & ROBBINS, INC.

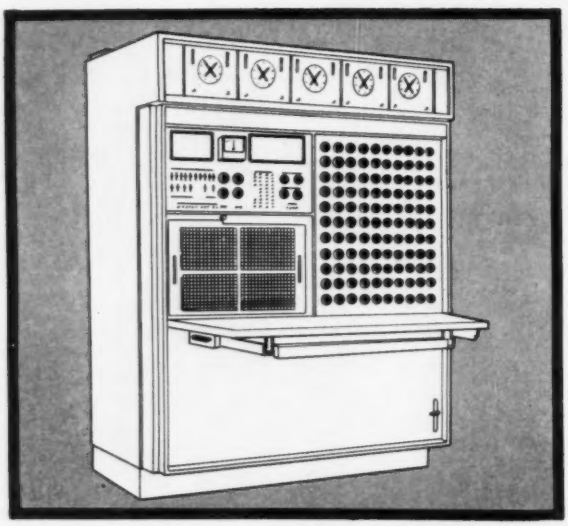
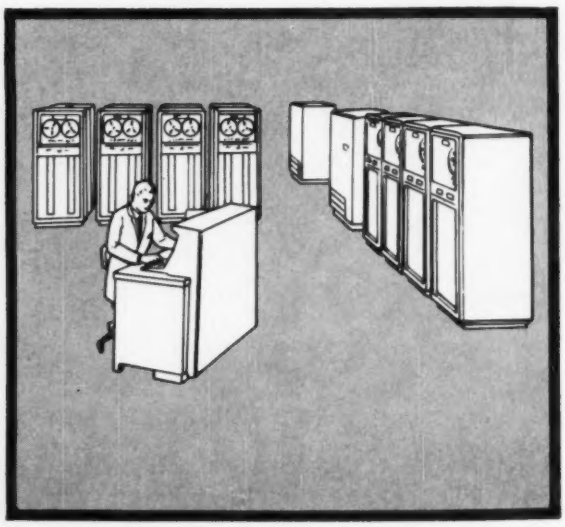
Division of General Precision Inc., Glendale, Calif.) are in operation.

General-purpose computer manufacturers seeking to invade process control face an uphill climb. But, in addition to IBM, Bendix Corp.'s Computer Division (Los Angeles) reports progress. It says that its multipurpose G-15 is the key unit in an automatic process control system (*CW, Oct. 1, p. 56*).

The new concept is gaining strength and in many cases process control will be a relatively simple extension of the general-purpose computer's function, rather than a significant departure involving substantial investment. In addition, the installation used at Whiting has an "interruption override" that automatically swings it off routine work onto process control in case of an operation upset. Thus it effectively offers the advantages of closed-loop control.

The IBM-Standard of Indiana development could trigger a rash of new developments in computer control.

Analog and Digital: The Difference

ANALOG	DIGITAL
Cost: $1,000 to $100,000	**Cost: $10,000 to over $1 million**
	
Function and Operation	
Analogs perform any mathematical calculation and simulate processes. Especially good for process study and calculus, an analog computer works like an electronic slide rule in which voltages and currents replace distances, indicating temperatures, pressures, flows, etc. Each problem is "taught" to the computer by wiring circuits.	*Digitals* can handle any calculation by breaking it down into multiple additions. Instructions and data, stored in electronic memory, are fed in and out on cards or tape from a battery of input-output units. The computer works like an electronic calculating machine. However, digitals can do up to 250,000 additions of 12-digit numbers per second.
Accuracy	
Usually, up to $\pm 0.1\%$ as it depends on measuring devices. Computer may lack stability over periods of time.	As accurate as the number of significant digits built into the machine – up to 40 on new devices.

Progress Report...

—2-Ethylhexyl acrylate
—UCON Rubber lubricant 77
—Propylene Glycol

2-Ethylhexyl acrylate—plasticizing comonomer

Many important advantages for vinyl acetate copolymers are offered by CARBIDE's 2-ethylhexyl acrylate. Its high plasticizing efficiency permits the use of as little as 10 to 15 per cent to give the same flexibility provided by twice the amount of competitive comonomers.

Since it polymerizes at a greater rate than competitive comonomers, 2-ethylhexyl acrylate can increase the throughput per kettle each working shift.

Use in the field has confirmed laboratory findings that 2-ethylhexyl acrylate improves low-temperature coalescing properties of latex paints and produces films with good water resistance and outstanding durability.

One of the distinctive pluses of 2-ethylhexyl acrylate is the opportunity it affords manufacturers to tie-in product advertising with the current widespread public acceptance of the term *Acrylic*.

For information on the many useful and profitable applications of 2-ethylhexyl acrylate, call your CARBIDE Technical Representative or use the coupon below.

New UCON rubber lubricant 77 for tires and foams

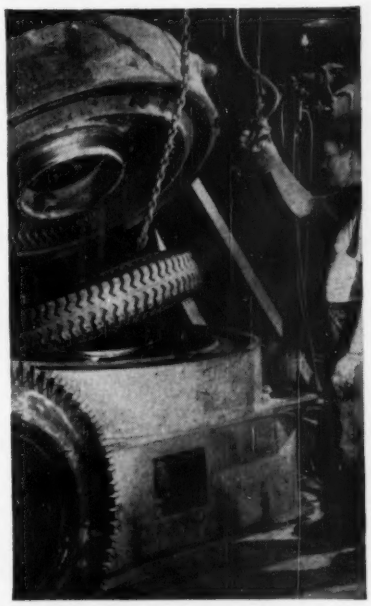
For more than ten years UCON lubricants and CARBOWAX polyethylene glycols have set the standard for liquid rubber lubricant performance.

Now, CARBIDE adds UCON Rubber Lubricant 77—a new material that has been especially designed to provide an economical answer to the exacting requirements of tire and foam rubber manufacturers.

UCON 77, a water-insoluble polyalkylene glycol derivative, can be used as a Bag-o-Matic and bladder lubricant in foam mold-release agents, and in many other rubber mold-release applications.

Clean break-away is provided because no gummy residue is formed on tire bags, bladders, or mold surfaces at vulcanizing temperatures. Mold-cleaning frequency is substantially reduced.

UCON 77 also has a low solvent and swelling effect on most natural and synthetic rubber compounds—including



butyl rubber—thereby adding greatly to bladder life.

UCON Rubber Lubricant 77 is available at competitive prices and in commercial quantities. For specifications and prices, call the Technical Representative at your nearest CARBIDE office. For a copy of a Technical Information Bulletin on UCON 77, use the coupon below.

Propylene glycol grooms cosmetics

An unusually useful item that cosmetic formulators should have in their bag of tricks is propylene glycol.

This colorless and odorless ingredient is an excellent solvent for dyes, essential oils, resins, vitamins A and B, and many other organic chemicals. Completely water miscible, propylene glycol acts efficiently as a mutual solvent, providing an intimate and stable dispersion for long shelf life and even spreading on the skin.

By increasing the emollient action of creams and lotions, propylene glycol promotes moisture retention by the skin. It is eminently suitable for toiletries and cosmetic preparations that come in contact with mucous membranes.

In cleansing creams, cleansing lotions, shaving creams, and hand lotions, propylene glycol adds to the soothing sensation the user readily associates with thorough, gentle action. And in cosmetics with high concentrations of stearic acid—such as vanishing creams and deodorants—propylene glycol prevents the unpleasant "rolling" effect during application.

For a copy of the paper, "*Propylene Glycol and Cosmetics*," please use the coupon below.

Tear out this coupon. Check the boxes on which you'd like more information, and mail to Dept. H, Union Carbide Chemicals Company, Division of Union Carbide Corporation, 270 Park Avenue, New York 17, N. Y.

- ☐ 2-Ethylhexyl acrylate
- ☐ UCON Rubber lubricant 77
- ☐ "Propylene Glycol and Cosmetics"

Name_____

Position_____

Company_____

Street_____

City_____ Zone_____

State_____

UCON, CARBOWAX and UNION CARBIDE are registered trade marks.

UNION CARBIDE CHEMICALS COMPANY

UNION CARBIDE

MEETS YOUR COMPLETE NEEDS FOR

organic di-valent sulfur compounds

R-S-R / R-SH / R-S-S-R

COMPLETE MODERN PRODUCTION FACILITIES

. . . especially suited to organic di-valent sulfur compound manufacture. Eliminates investment in special equipment not in full-time use.

EXPERIENCED RESEARCH AND DEVELOPMENT STAFF

. . . saves you money on process development costs.

AVAILABLE IN COMMERCIAL QUANTITIES

Mercapto Acids, Thioethers, Disulfides, Thiophenols, Amino Mercaptans, also Alkyl and Aryl derivatives of the above classes of compounds. Or Evans can tailor your sulfur compound requirements.

Add this plant to your present facilities... at no extra cost!

For full information, fill in and mail coupon today.

EVANS CHEMETICS INC.
250 E. 43rd St., New York 17, N.Y.

☐ Send me a complete list of available organic di-valent sulfur compounds.
☐ I would like additional information on

_____

☐ Have your representative call me

Name _____

Position _____

Address _____

Company _____

Prefab Refinery

The first full-scale, prefabricated refinery unit has been shipped from Houston, Tex., to Puerto Matis de Galves in Guatemala. Designed by Lummus for processing a blend of natural gas and Venezuelan crude oil (Guatemala has no crude production of its own), the unit will be used by Shell Oil and Breaux Bridge Oil Refining Co. The refinery will be the first in Central America and the only one situated between Mexico and Panama.

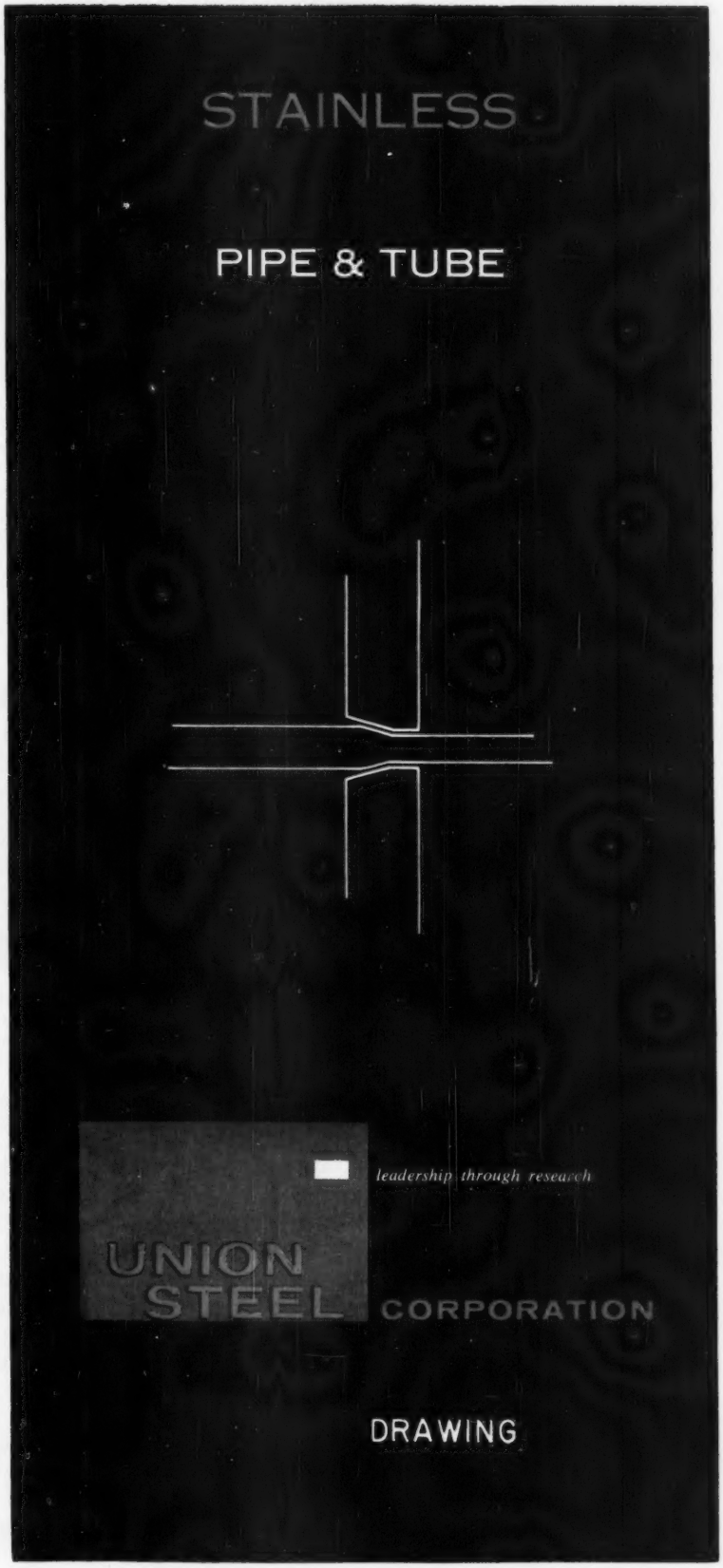
In the new, $5-million unit, crude distillation separates gas, straight-run gasoline, reformer feedstock and heavier ends. Atlantic Refining's reforming process is used to upgrade intermediate products to high-octane gasoline. Gasoline is desulfurized in a unit based on a Union Oil process. Capacity is 4,000 bbls./day of crude. Final products are premium gasoline, regular gasoline, kerosene, diesel oil, bunker "C" fuel oil and liquefied petroleum gas.

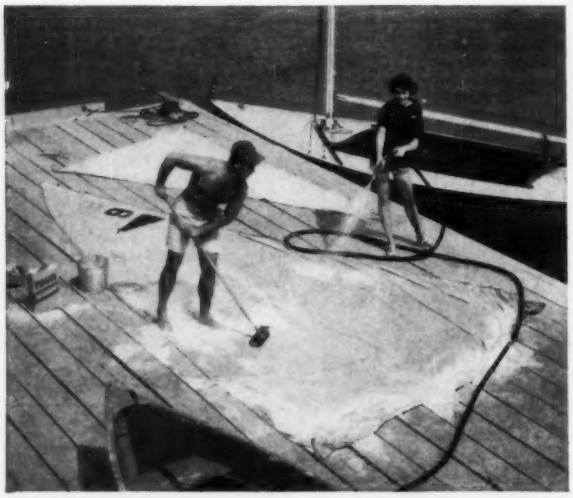
Skid Setup: Lummus put the units of its refinery on skids, since the remote location of the construction site, lack of skilled labor, and the long rainy season made it expensive to construct massive foundations. Use of the skids permitted the refinery to be erected on pad-type foundations and allowed most of the construction work to be done near Houston.

Seven skids were required. They were shipped with the refinery mounted — furnaces, compressors, steam generators, exchangers, instruments, electrical wiring and piping— except for the major distillation towers and off-site storage tanks. The largest of the skids is 12x22 ft. and weighs 20 tons; the heaviest, 36 tons, measures 12 x 20 ft.; and the smallest, 8 x 14 ft., weighs 12 tons.

When the new refinery unit is completed, crude oil feed will be pumped three miles inland to the refinery through a 14-in. line.

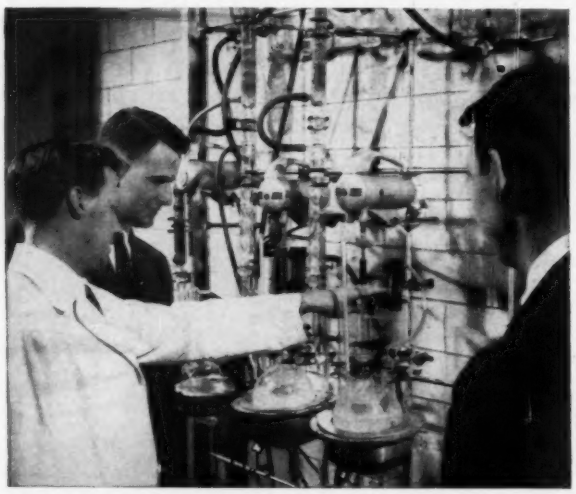
The new refinery, called Refinera Matias de Galvez, will be able to meet only about one-half of Guatemala's demand for petroleum products. There's a clear need for another refinery—and if the Lummus skid-mounted design works out well, chances are that the technique will be used also on plants that are subsequently built in the area.



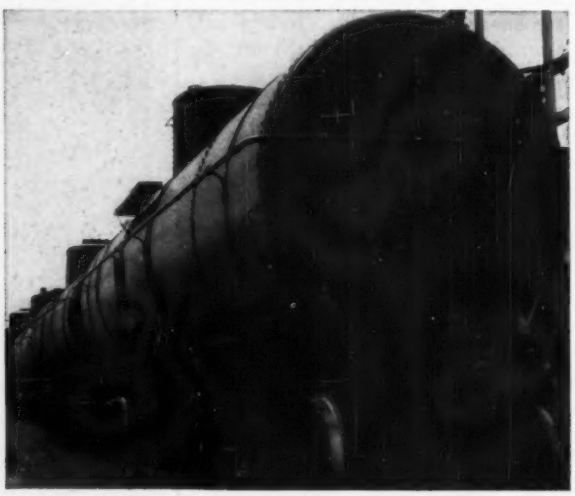


ENJAY OLEFINS – Enjay markets tetrapropylene, tripropylene and nonene. These chemicals fulfill the most rigid requirements as raw materials for anionic and nonionic detergents. Uniform purity and high quality contribute to the modern detergent's ability to get hard-to-wash surfaces cleaner.

TRIDECYL ALCOHOL – Water soluble nonionic surface active agents formed by the reaction of tridecyl alcohol with ethylene oxide are extremely well suited for use as household detergents. Surfactants made with tridecyl alcohol help increase penetrating power and loosen dirt.



TECHNICAL ASSISTANCE – At the Enjay laboratories, expert technical assistance and the latest testing facilities are available. Here, Enjay technical personnel can help you develop new products and improve existing ones.



QUICK SHIPMENTS – Shipments are made from conveniently located plant and storage facilities. Surfactant manufacturers are assured of prompt delivery and high uniform product quality when they order from Enjay.

HOW ENJAY SERVES...the surfactants industry

Enjay offers the surfactants industry the following high quality materials for all types of detergents, wetting agents, emulsifiers, sanitizers and foam control agents: Tetrapropylene • Tripropylene • Nonene • Tridecyl Alcohol • Decyl Alcohol • Isooctyl Alcohol • Isopropyl Alcohol • Benzene. For technical assistance or to order Enjay chemicals contact the nearest Enjay office.

HOME OFFICE: 15 West 51st Street, New York 19, New York. OTHER OFFICES: Akron • Boston • Charlotte • Chicago • Detroit • Houston • Los Angeles • New Orleans • Tulsa

EXCITING NEW PRODUCTS THROUGH PETRO-CHEMISTRY

ENJAY CHEMICAL COMPANY

A DIVISION OF HUMBLE OIL & REFINING COMPANY

ENJAY
PETROCHEMICALS

Washington
Newsletter

CHEMICAL WEEK
October 22, 1960

An attack on identical bidding on government contracts—some cases involving the chemical industry— will be launched early next year in a report by Sen. Estes Kefauver's Antitrust Subcommittee.

The committee has held only two hearings, involving TVA, but for some time has been receiving reports from the Defense Dept. and TVA showing identical bidding on a number of items. These include cement, chemicals, steel, and power equipment.

Speculation is that this report will substitute for hearings, and the next move will be either an attempt at legislation or further antitrust actions by the Justice Dept. similar to the Philadelphia grand jury hearing now in progress on alleged rigging of bids in the electrical equipment industry.

Originally the subcommittee intended to hold hearings in Washington but has now decided that enough information can be collected and put into the report without hearings. A first draft is already under way, although the final report must be approved by the members of the subcommittee.

A Pentagon official says identical bidding is something that has haunted every government buying agency, and the Defense Dept. is determined to find out why it happens and how it comes about.

•

U.S. trade officials feel the boom in exports to Europe is solid, not just a temporary thing. They discount reasoning that it's a one-shot reaction to removal of many restrictions.

In the long run, increased standards of living in Europe will create more demand for U.S. goods, on top of rising European productive capacity. U.S. exporters are just beginning to recognize and take advantage of some new trade opportunities, such as quoting delivered prices instead of prices at the U.S. port, which frightens some buyers who figure the freight costs would be bigger than they really are.

Exports to Western Europe have risen 50% this year vs. '59.

•

Synthetic fiber imports will be studied by the Tariff Commission to find out whether foreign competition is injuring domestic production of nylon, rayon (except acetate) and others.

Holding an investigation implies that the "peril point" already has been passed and that U.S. import tariffs are too low on these fibers. The investigation is authorized under the escape clause of the Reciprocal Trade Agreements Act, by which tariff negotiators at GATT meetings in Geneva may not lower tariffs below the peril point. Although Tariff Commission findings on the peril point are secret, the implication is that a hearing would not be held unless the peril point had been reached.

Washington Newsletter

(Continued)

Thiokol-Reaction's Guardian series of prepackaged, storable, liquid-propellant rocket engines is being considered for use as the propulsion system for the Navy's Sparrow IV air-to-air missile. This is an advanced version of an operational missile powered by an Aerojet-General solid-fueled rocket.

This would be the first selection of a liquid-fueled rocket to power an air-to-air missile. The Navy and the Air Force have both become disenchanted with the solid-type rockets for small air-launched missiles. These weapons come in for rough handling in the field. The solid-propellant engines have proved to be inadequate under such operating conditions. Rough handling leads to cracking of the propellant, which in turn results in irregular firing, excessive acceleration or blowup.

•

Adequate supplies and stabilized prices for residual fuel oil are the aim of a two-pronged move by the federal government.

Demand for the fuel, used to provide steam and heat in many chemical plants, will show a sharp seasonal increase in the coming winter months. To avoid spot shortages and price disruptions, revised control programs are planned by two agencies. The Interior Dept. has proposed expanding the number of companies authorized to import the fuel oil and also plans a redistribution of allocations among existing importers. The Office of Civil and Defense Mobilization will require each importer to make monthly reports on prices and deliveries.

The actions came after complaints during the summer that a few major importers, holding a lion's share of the allowable imports, were almost able to control the market. Prices for fuel oil increased by 15¢/gal. in New England, and a number of consumers complained they were unable to receive their normal supplies. The revisions in the oil imports control program are not expected to increase the total amount of fuel oil imported into the Eastern sector of the U.S., but government officials hope a redistribution of quotas and strong price surveillance will stabilize the fuel oil market.

•

"Republican retreat from responsibility" in development of natural resources is charged in a report published by the Democratic Advisory Council's Natural Resources Committee. The Democrats promise to be more aggressive. Their approach: long-range planning by a special council, capital budgeting to separate self-liquidating projects from annual budgets, a national investment fund, a youth conservation program, and a big R&D program in such matters as how to better utilize mining and oil resources. It pledges strong action on water and air pollution, development of low-cost power.

The council charges that Republicans have cut the budgets for land conservation programs, given away oil and mining rights on national park land, vetoed water-pollution programs and let river development come to a standstill with its "no new starts" policy.

FUMARIC ACID

NOW
WORLD'S
LARGEST
BASIC
PRODUCER

NOW
. . . immediately available
. . . competitively priced

NOW
GUARANTEED
SPECIFICATIONS

a completely non-captive producer

FERMENTATION CHEMICALS

BZURA

Clark St., off Broadway
Keyport, New Jersey / Fieldsboro, New Jersey

SEND for just issued, new specification shee and prices of BZURA FUMARIC

Wherever you are, a General Mills technical man is nearby to help lighten your load

Two new offices now open in continuing program of customer service

North, South, East, West—wherever you are, General Mills is continually seeking better ways to serve you. Expanded service is just one way. John Edison and Ron Sundberg are opening the new General Mills Chemical Division offices in St. Louis and Detroit respectively. Both have fine chemical backgrounds and field experience, and are well equipped to serve you.

ST. LOUIS
34 N. Brentwood Blvd.
(Clayton, Mo.)
PArkview 1-6141

CLEVELAND
20800 Center
Ridge Road
EDison 3-1688

LOS ANGELES
Workman Mill Road
Whittier, Calif.
OXford 2-7771

DETROIT
15800 W. McNichols
Rd. VErmont 7-3104

PHILADELPHIA
1445 City Line Ave.
MIdway 9-2400

CHARLOTTE
1925 N. Tryon St.
375-3272

BOSTON
214 Harvard
BEacon 2-7717

KANKAKEE
Post Office Box 191
WEIls 2-6751

HOUSTON
821 Chelsea Blvd.
JAckson 2-5079

NEW YORK
156 William Street
COrtland 7-6700

OAKLAND
801 East 10th Street
TEmplebar 4-8400

Decisions. Details. Technical problems. Yours is a busy day. If anyone could possibly be as concerned about the complexities of your business as you are, your General Mills Chemical Division representative is the man. Customer service is his business. He comes to lighten your load, to help make your buying decisions easier. He will give you accurate information about Chemical Division products, show you ways in which you can best utilize these products—often at a considerable saving in time, money and manpower. He will keep you up to date on latest Chemical Division research. He will arrange for prompt, competent technical service whenever required. He will help make sure your deliveries arrive on time, and that they meet the exact specifications you requested. Customer Service is his business.

CREATIVE CHEMISTRY FROM GENERAL MILLS SERVES INDUSTRY WORLD WIDE

General Mills **CHEMICALS**

CHEMICAL DIVISION Kankakee Illinois and Tlalnepantla, Mexico

Versamid ® Polyamide Resins, Genamid Epoxy Curing Agents, Fatty Nitrogen Curing Agents, Gen Epoxy Epoxy Resins, Deriphat Amphoteric Surfactants, Sterols

Mule Team Drivers Speed Up

Next week four top English executives from Borax (Holdings) Ltd. will inspect the California facilities of U.S. Borax & Chemical Corp. to see what changes have been wrought by this subsidiary, which "declared national independence" from its English parent and became a U.S. corporate citizen four years ago.

To the visiting Britons—the Rt. Hon. Lord Clitheroe, chairman of the board, and three other top directors of Borax (Holdings) Ltd. (and of U.S. Borax' immediate parent, Borax Consolidated Ltd.)—U.S. Borax will show its new plants and mining site, hold a board meeting and demonstrate the company's new administrative setup at work.

Since becoming a U.S. company U.S. Borax has started pushing into the chemical process industries by stepping up its quest for new products. Underlying the change from simply mining and processing borax to major expansion of both industrial and consumer chemical lines is a new organization designed to get maximum mileage out of all levels of management.

The Company Chart: At the top sits J. M. Gerstley, English-born president and 27-year veteran of the borax business. A strong believer in long-range planning, Gerstley is applying the spurs to U.S. Borax' rapidly expanding research efforts. He feels the company's future lies in research, and the major effort of its wholly owned research arm, U.S. Borax Research Corp., is directed toward chemicals.

Next to him is Hugo Riemer, executive vice-president, who joined the company in '58. Riemer, with an established reputation for effective organization and top-level administration, believes that a company must be staffed by experts who are given free reign to function as experts. He has accomplished this by filling 11 top posts, representing five key areas —production, technical, administration, marketing and consumer products—with experienced men who report directly to him and are spared as many red-tape headaches as possible.

Organizational Evolution: The present U.S. Borax organization, which has been pruned and shaped to fit the company's immediate and foreseeable needs, is the result of many changes and rearrangements. The company was created in '56 by acquisition and merger—acquisition of Borax (Holdings) Ltd.'s borax business in this country, merger with United States Potash Co., and incorporation in the U.S.

Prior to '56, Borax (Holdings) Ltd. —then named Borax Consolidated Ltd.—operated its American borax business as a division under the name Pacific Borax Co. It also owned 31% of U.S. Potash Co. common stock. Today, Consolidated Borax, Inc., a wholly owned subsidiary of Borax (Holdings) Ltd., owns approximately 74% of U.S. Borax common stock.

Formation of U.S. Borax & Chemical as a U.S. corporation offered a number of advantages to the British firm:

(1) The scope of operations was increased, since previously the company had built its business around one element—boron. The inclusion of U.S. Potash Co. increased manufacturing and profit potential.

(2) U.S. incorporation made it easier and cheaper to borrow money for large capital expenditures, provided additional avenues for financing besides retained U.S. earnings.

(3) It provided eligibility for U.S. government security clearance to classified information and for research contracts in a high-energy fuel program, putting it on an equal footing with competitors.

(4) As an American corporation, the company could enjoy depletion allowance tax advantages, since these tax savings had previously been turned over to the English parent.

Growing Pains: But reorganization of the company's structure and the merger with U.S. Potash threw many new burdens on its management—administrative burdens it had not met while a division of the English parent.

The new U.S. company was first set up on a divisional basis, along product lines: Borax Division, Potash Division and 20 Mule Team Products (consumer products) Division. But after a three-year trial under this type

U.S. Borax President Gerstley: 'The major emphasis is being put on research.'

Vice-President Riemer: 'Hire experts, give them freedom to function as experts.'

THE
PENNSYLVANIA PLAN:
100% financing
for your
new plant

Complete financing for Lease-Purchase of a new plant is available in labor-surplus areas of Pennsylvania through combined efforts of lending institutions, non-profit community organizations and the Pennsylvania Industrial Development Authority. Interest as low as 2%, with deferred amortization, can be applied on up to one-half of total plant cost.

100% financing is also available in other areas of the State, provided by community organizations, banks, insurance companies and other sources. You select the community you want. You specify plant construction details or choose one of several plant "shells" now being readied for completion.

100% Financing at a Glance . . .
Industrial Plant Construction Costs—
Subscribed by local non-profit community sponsored builder-owner corporations. 20%
2nd Mortgage Loan, Pennsylvania Industrial Development Authority. 30%
1st Mortgage Loan obtained from banks, insurance companies and similar lending institutions. 50%
Total financing, secured through local subscriptions and mortgage loans, without cash investment by the manufacturer. 100%

For free copy of "Plant Location Services" pamphlet, or for details on 100% financing, write or call:

Pennsylvania Department of Commerce
South Office Building
957 State Street, Harrisburg, Pa.
Phone: CEdar 4-2912

of organization, it became apparent to management that such a system fell short of needs.

As it turned out, the three divisions were operating as three separate companies except for major policy decisions and a centralized accounting system. In pursuing broader operations, other deficiencies were revealed: duplication of staff functions, inadequate internal communications and an insufficient number of technical personnel to cope with additional problems arising from the merger.

Therefore, in Sept. '59, Gerstley and Riemer got approval from the board of directors to shift from the divisional system to what it calls "a functional one." The switch was intended to serve three basic purposes: (1) provide the company with a hard-hitting team of experts in command of basic management functions, regardless of product; (2) eliminate management and administrative duplication; and (3) establish middle and lower management structures to exploit talent in all departments.

Unlike many companies' sweeping changes in management setups, U.S. Borax' change was made without a wholesale ouster of incumbents. Gerstley and Riemer were convinced that the problem did not lie with existing management but was largely a question of rearranging and augmenting the experienced talent they already had. The change was made with personnel from Pacific Borax and U.S. Potash, and effected with the loss of only one man from top management.

In talking with CHEMICAL WEEK, both Gerstley and Riemer expressed their satisfaction with the new setup after a year's shakedown, but indicated their intentions to keep the organization flexible, even subject to being reorganized completely when operations grow to warrant it.

Product Picture: Since its products —even after the U.S. Potash merger— still centered on boron, U.S. Borax was naturally involved in the Defense Dept.'s efforts to get high-energy boron fuels. It had contracts for delivery of certain boron products to Callery Chemical Co. and Olin Mathieson Chemical Corp. until the military canceled production contracts with these companies in Aug. '59.

These contracts, although small financially, nevertheless put the company's foot in the door to government-sponsored research. Today, the company emphasizes "the development of a broader and more lasting base for our company, the peacetime civilian markets." In discussing the government contracts it still has, Borax points out that these are in the area of civilian application, too, such as recent activity centering on boron polymers.

According to Borax (Holdings) Ltd., "The glamour surrounding high-energy boron fuels has tended to obscure the fundamental value of [U. S. Borax'] business." That business is essentially what it has always been, since U.S. Borax' California reserves of borate ore are the world's largest. It's described as the world's leading producer of boron products and the second-largest producer of potash in the U.S.

The company believes its borax position is stronger than that of its competitors, since virtually 100% of its reserves are recovered. The reserves are said to be among the world's richest, and the ore is 70% pure when it comes out of the ground. Borax has no by-product sales.

Company sales, climbing steadily, reached a high of $62,191,620 in '59, and are expected to set a new record this year.

For the Future: As to what the chemical process industries can expect from U.S. Borax as competition, the company is somewhat vague. It will continue research in the organic and inorganic chemistry of boron, exploiting and expanding markets wherever possible.

Gerstley adds that U.S. Borax is looking for expansion opportunities by acquisition of patents, processes or other businesses, or by joint ventures.

However, the company does plan to carve its own niche in industrial chemicals, since boron as an industrial chemical has new, proved uses in the nuclear field and potential uses in the electronic and missile industries. The company also indicates that it will try to push into the agricultural chemical marketplace, increase its solid, 20 Mule Team Borax (and related products) consumer business.

Since new products and applications from boron research are already boosting earnings, any major growth will probably depend on the discovery of big, new markets. Gerstley, Riemer and company are going after them.

WHY

YOUR IDEAL SOURCE OF BASIC NITROGEN IS

DU PONT METHYLAMINES

3 strategic shipping points to assure you of prompt delivery—low inventory with Du Pont Methylamines

- **CARNEY'S POINT, N.J.**
  Mono-, di- and trimethylamines
- **CLEVELAND, OHIO**
  Dimethylamine
- **STRANG, TEXAS**
  Mono-, di- and trimethylamines

DU PONT
REG. U.S. PAT. OFF.

BETTER THINGS FOR BETTER LIVING
...THROUGH CHEMISTRY

High-purity Du Pont methylamines minimize undesirable side reactions . . . are low in cost, very soluble in water. Each type is available as a compressed anhydrous gas in a lightweight cylinder or tank car, or as an aqueous solution in drum or tank car.

You can use Du Pont methylamines in the manufacture of:

Animal nutrients	Insecticides	Rubber chemicals
Drugs, pharmaceuticals	Ion exchange resins	Rocket fuel
Dyes	Leather	Surface active agents
Fungicides	Photographic developers	Quaternary ammonium salts
Herbicides	Solvents	

Du Pont methylamines are members of a family of Du Pont amines and amine derivatives, which also includes diethylamine, dimethylformamide (DMF), dimethylacetamide (DMAC).

SEND FOR THIS INFORMATION BULLETIN which reviews properties and chemical reactions obtainable with Du Pont mono-, di- and trimethylamines. It also discusses uses and lists references for further study by development personnel. Mail coupon below for your copy.

E. I. du Pont de Nemours & Co. (Inc.)
Industrial and Biochemicals Department
Room N-2539-CW, Wilmington 98, Delaware

Please send me your bulletin on Du Pont methylamines.

*Name*_____ *Title*_____

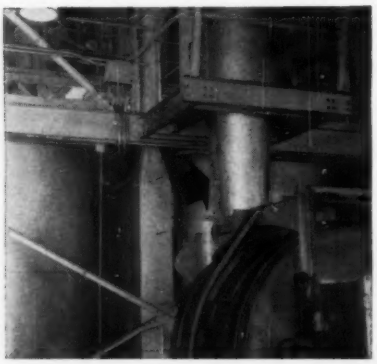
*Firm*_____

*Address*_____

*City*_____ *State*_____

Problem:

To reduce cost of blending 200 dry powder formulas from 52 raw materials



Solution:

SPROUT-WALDRON
PNEUMATIC SYSTEM

Pushbutton blending of over 200 different dry powder formulas, from 52 raw materials at Dearborn Chemical Company is credited with a 1300% increase in manpower efficiency. 98,000,000 lbs. a year of diverse formulas for water conditioning and corrosion control can now be turned out by sixteen operating and maintenence personnel at the Dearborn plant. This rate of 6,125,000 lbs. per man per year is contrasted with the rate of 438,500 lbs. per man per year at their old plant.

Credit for this tremendous increase in efficiency goes to the speed and automation of the Sprout-Waldron pneumatic handling system. This air transfer system handles the dry chemicals at rates to 80,000 lbs. per hour over a 25 ft. horizontal run and a 69 ft. lift.

Sprout-Waldron positive and negative pressure systems are helping industry cut costs and speed handling. Further specific information can be found in Bulletins 118 and 208. Copies available on request.

CW/106

SW SPROUT-WALDRON
Muncy, Pennsylvania

Size Reduction • Size Classification • Mixing
Bulk Materials Handling • Pelleting

ADMINISTRATION

Union Comeback Bid

Baytown Employees Federation, recognized union at Humble Oil's Baytown, Tex., plant for 20 years before being replaced in an election last year by Oil, Chemical & Atomic Workers Union, has moved to regain its position. BEF petitioned the National Labor Relations Board in Houston asking that an election be held to determine which union is preferred by employees of the plant. It claims to have 1,200 signers among the plant's 3,100 production and maintenance employees.

LEGAL

Patent Suit: American Cyanamid Co. has charged Hercules Powder Co. (Wilmington, Del.) with infringing a patent on wet-strength resins for paper in a suit filed in Wilmington federal district court. Cyanamid alleges Hercules has been selling "without leave or license" resin compositions of a type (Kymene) patented by Cyanamid in '52. An accounting of profits and a cease-and-desist order are requested in the petition.

•

Paper Waste: In a test case, a Newport, Ore., motel owner is suing for an injunction to halt Georgia Pacific Paper Co. from dumping waste into the Pacific Ocean off Newport and for an award of $302,250 in damages. He claims that odors from the company's sulfite kraft mill waste discharges have driven guests away. The company's method of waste discharge was originally approved by the Oregon State Sanitary Authority.

•

Antitrust Denial: Hooker Chemical Co. has denied Federal Trade Commission charges that it made two acquisitions in violation of the Clayton Antitrust Act. FTC earlier complained that Hooker's purchase of Durez Plastics and Chemicals, Inc., and the phenol business of Monsanto Chemical Co. tended to lessen competition in the production and sale of phenol molding materials and products containing phenol.

Hooker denied that its two acquisitions had any harsh effects on the phenol industry and claimed, contrary to FTC complaint, that it is "relatively easy" for a company to get into the business.

Overtaxed in Wartime: The U.S. Supreme Court this week agreed to hear a complaint by G. D. Searle & Co. (Chicago) that it overpaid $3.6 million in income taxes during the Korean War. The complaint revolves around Searle's patents on two drugs—Banthine, for treatment of peptic ulcers; and Dramamine, for prevention of seasickness, etc.

Searle claims its profits on these compounds were categorized under a clause in the Korean War excess profits tax law, which partly exempted profits from the sale of products resulting from inventions. The Internal Revenue Service claims the drugs did not fit this clause. The case, and a similar one by Polaroid Corp., will mark the first time this clause of the tax law will be considered by the high court.

KEY CHANGES

Bjorn Holmstrom to chairman of the board, **Francis W. Theis** to president, chief executive officer, Pittsburgh Plate Glass Co. International, S.A., subsidiary of Pittsburgh Plate Glass Co. (Pittsburgh).

Lee L. Gibson to board of directors, The Wander Co. (Chicago).

Richard V. Colligan to vice-president, Freeport Sulphur Co. (New York).

William A. Suiter and **Rhoda M. Stewart** to vice-presidents, Marbon Chemical Division, Borg-Warner Corp. (Chicago).

William H. Frey to vice-president, sales, **John M. Frey** to treasurer, Puritan Chemical Co. (Atlanta, Ga.).

Walter J. Nock to vice-president, Mexican Division, American Smelting and Refining Co. (New York).

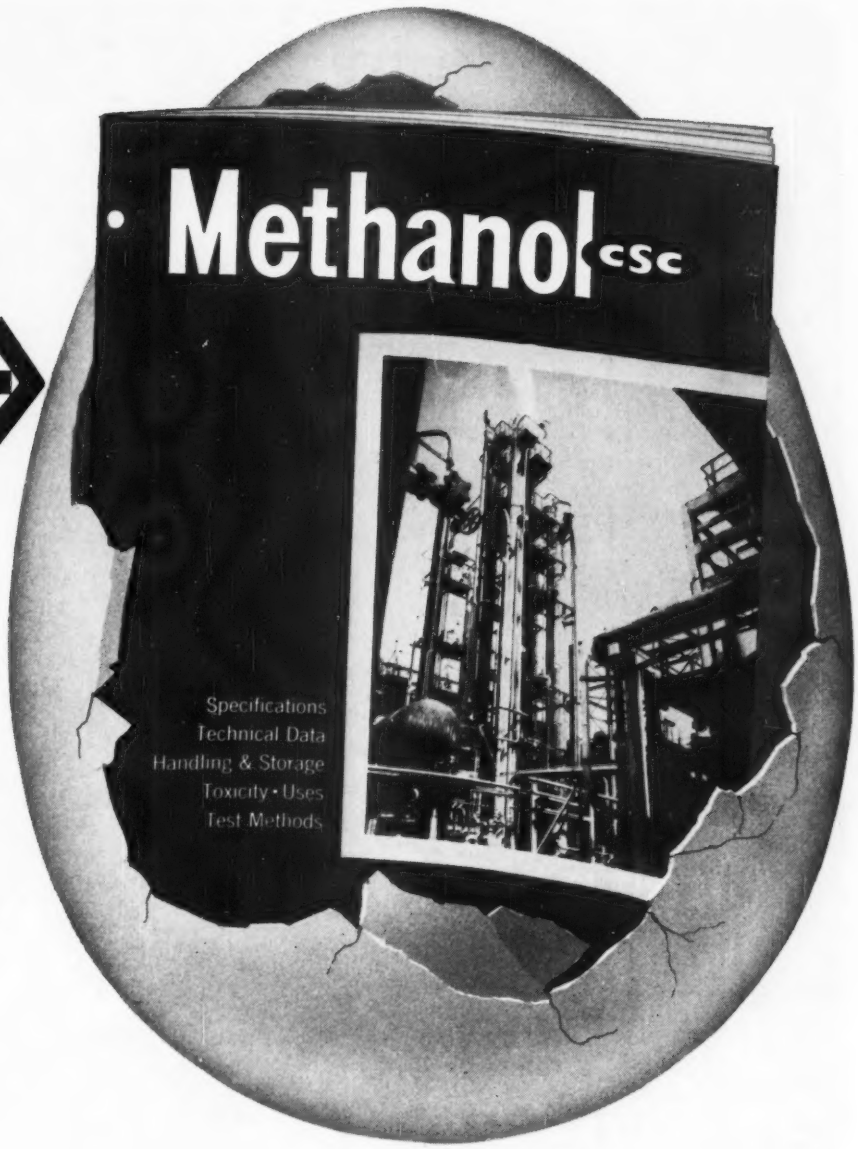
A. F. Hamilton to vice president, general manager, Texas Gas Exploration Foreign C.A., subsidiary of Texas Gas Exploration Corp. (Houston).

George B. McMeans to vice-president, Kaiser Industries Corp. and Henry J. Kaiser Co. (San Francisco).

Peter Colefax to chairman of the board, American Potash & Chemical Corp. (Los Angeles).

W. R. Johnson to president, Dayton Paper Stock Co., subsidiary of The Gardner Division, Diamond National Corp. (New York).

Just out!



NEW METHANOL GUIDEBOOK

Just off the press – the new CSC Methanol Guidebook. It's packed with solid "meat" . . . and it's yours without obligation. 32 pages . . . 36 useful tables, graphs and charts . . . information sections include specifications, chemical properties, physical properties, uses, toxicology, shipping, handling, storage and specification test methods. *Mail coupon for your free copy.*

INDUSTRIAL CHEMICALS DEPARTMENT

COMMERCIAL SOLVENTS CORPORATION

260 MADISON AVENUE, NEW YORK 16, N. Y.

Please send me the new CSC METHANOL GUIDEBOOK.

NAME_____ TITLE_____

COMPANY_____ STREET_____

CITY_____ ZONE_____ STATE_____

On the move to serve you better

Everything at PITT-CONSOL is on-the-move to help you keep pace in today's competitive market. Resources, raw materials, people, skills... *the ability to adjust swiftly to fill urgent requirements*... are all smoothly coordinated for *complete* buyer satisfaction.

In addition to high quality chemicals, you can expect and get the ultimate in service-support and personal follow-through. Specify PITT-CONSOL for the extras that give you the edge.

PITT-CONSOL CHEMICALS

PITT-CONSOL
Chemical Company

191 Doremus Avenue • Newark 5, N. J.
A SUBSIDIARY OF CONSOLIDATION COAL COMPANY

HIGH QUALITY PHENOLS, CRESOLS, CRESYLIC ACIDS • RUBBER CHEMICALS • ARYL MERCAPTANS • ALKYLATED DERIVATIVES

Permutit's Carrington and Elliott map plan for more dealers.

Harder Sell for Softeners

A novel twist in merchandising water softening equipment may put new life in the $4-5-million/year business of selling water softening resins for home use. The idea comes from Permutit Water Conditioning, Inc. (New York), producer of both equipment and resins. Its plan, in essence, is to make the units that use resin more readily available to dealers, hence to householders.

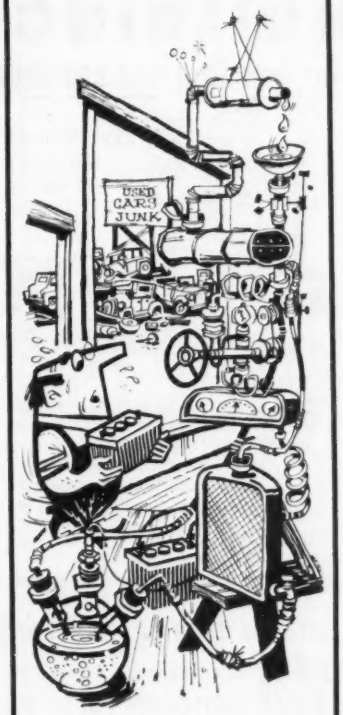
Permutit's move underscores the close ties between sale of the softening units and sale of resins. There is no resin replacement market to speak of; an average softener gets about ¾ cu. ft. ($12 worth) of resin only when it's installed. Thus the continued sale of resins depends on new equipment used—and so far only about 9% of the 35 million homes that could use the softeners now have them.

Big reason for the reluctance of many householders to buy units lies in their cost—up to $500 or so. This high tab has lured some 100 firms into making the units, but so far none of these has managed to make much headway in promoting water softening to the public. And the half-dozen major resin producers—Rohm & Haas, , Dow Chemical, Pfaudler Permutit's Ionac Chemical Division, and Chemical Process Co.—haven't wanted to take on the job of promotion themselves.

Removing a Bottleneck: Permutit, sole producer of both equipment and chemicals for this field, is trying to side-step the high cost hurdle by expanding the rental part of its business. It is now set up to lease automatic water softeners, which need no servicing, to its dealers instead of selling them outright. In addition, it is promising to finance a dealer's cost of making the initial rental contact and the expense of installing the unit.

In the past a water conditioner dealer had to put up $25-35,000 to get into the business. Dealers with little or no financial backing had to take a relatively large risk at the outset, then wait several years to get back their investment and a profit.

Permutit's Vice-President of Sales Richard Carrington told *CW* that with his company's plan a dealer is relieved of a long-term, heavy capital investment, can use his working capi-



Maybe Eastman has a better method

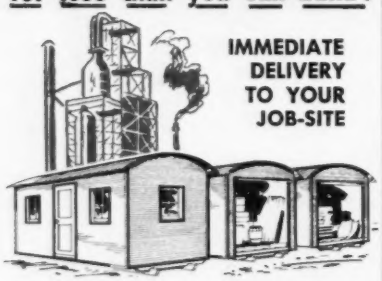
Got a production problem? Does it involve the manufacture of a compound that's not generally available in the quantity or purity you require? Then consider this. We are equipped for and experienced in synthesis on a custom basis for quantities in the larger-than-laboratory-but-less-than-tankcar range. For information about this service, or a quotation, write *Distillation Products Industries,* Eastman Organic Chemicals Department, Rochester 3, N. Y.

DPi

DISTILLATION PRODUCTS INDUSTRIES
is a division of
EASTMAN KODAK COMPANY

PORTABLE BUILDINGS

for less than you can build!



IMMEDIATE DELIVERY TO YOUR JOB-SITE

IDEAL FOR:
Field offices, warehouses, tool storage, garages, gate houses, change houses, in-plant applications, etc.

- Covered with .020 gauge aluminum
- All lumber No. 1 S P I B yellow pine
- All floor joists, diagonal bracing and plates mortised to adjoining parts
- Built complete with doors, windows, floor—ready for use
- Mounted on pressure-creosoted skids
- Sizes from 8' x 10' to 12' x 40'

LASTS FOR YEARS • EASILY MOVED

Write for brochure and price list.

M-P BUILDING SALES CO.

2397 Railroad • Beaumont, Texas

Chemical Week

is the only magazine edited exclusively for management men — at all levels and in all functions here in the Chemical Process Industries. Read it regularly to keep apace of your job . . . advertise in it often to keep ahead of your competition.

tal for expansion. Only requirement: the dealer must have a net-worth rating of $10,000.

Rental Resins: Permutit's move may help shift the industry's emphasis away from selling units to renting them. There is still some difference of opinion whether the industry's future lies with rental or with outright selling—and though some 1.5 million units (about half the units now in use) are now rented—recent emphasis has been on sales.

Permutit is not passing up direct sales. But it believes now that the relatively low rental fee—$5/month—is easier to put across than is a typical $500/unit investment. Further, there's less resistance from the householder who would be reluctant to put $500 into a unit that he can't reinstall easily if he should move.

In emphasizing rental, Permutit is bringing a fairly unusual practice to the fore: it is featuring automatic units, which will automatically run through the regeneration cycle when the sodium ions have been exhausted from the resin.

Many of the other major companies that are renting softeners—e.g., Servisoft Division of George Getz Co. (Rockford, Ill.)—have units in which the resin bed must be changed every few weeks. This is done by a serviceman who puts in the fresh resin cylinder and takes the exhausted resin to his plant for regeneration.

In the Open: Although Permutit characterizes its financing program as a "first" in the industry, trade sources say that such a plan has been practiced by some other companies for some time. In their opinion, Permutit's "first" is that it has openly made such practices established policy.

Culligan, Inc. (Northbrook, Ill.), biggest manufacturer of water conditioners and responsible for 50% of the units in existence, has a system of financing sale of its equipment to dealers over a four-year period. The Bruner Corp. (Milwaukee), a division of Hagan Chemicals & Controls, has a similar "easy-payment" plan.

The main companies now in the field — Culligan, Permutit, Bruner, Lindsay, and Servisoft — may have another competitor in the near future. RCA Whirlpool Corp. (Benton Harbor, Mich.) has been considering entering the business but has been stymied so far because it cannot work out a suitable method of distribution.

Resin's Role: Resins used in typical softeners for homes are cation-exchange resins. They swap sodium ions for the calcium and magnesium ions of hard water—the latter ions form scum with the anions of soap; sodium-soap combinations present few problems in the home units.

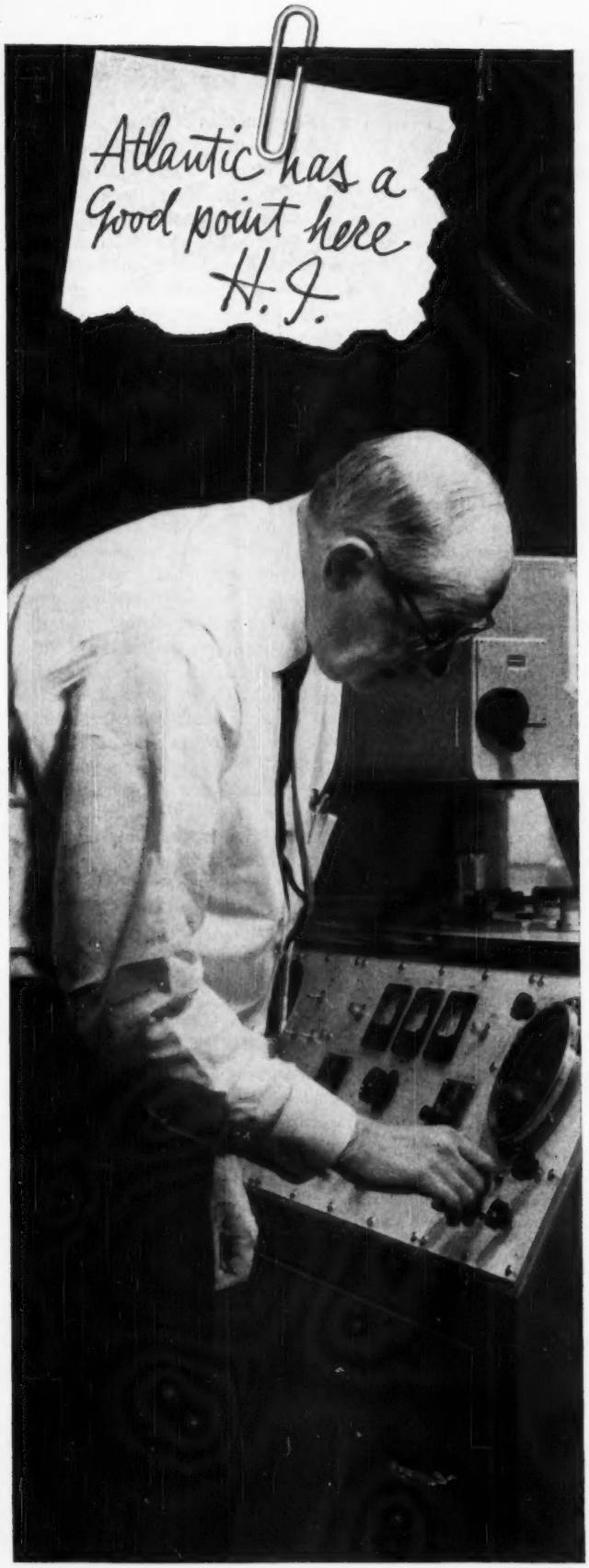
Unit size and resin capacity varies considerably, with from 0.4 cu. ft. to 2.5 cu. ft. of exchanger needed; the average unit takes about ¾ cu. ft. of resin. Resins are shipped in polyethylene-lined burlap bags holding a premeasured quantity of resins. This is added to the softener unit only when it is installed.

For about the last 12 years, resins have been of the sulfonated polystyrene-divinylbenzene type. However, Rohm & Haas has recently come up with what it claims is an improved material for home softeners. This is Amberlite 200, a sulfonated divinylbenzene copolymer said to have greater physical and chemical stability than standard resins. The big advan-

New Switch in Lighting

Sylvania Electric, developer and first commercial producer of electroluminescent lighting devices, has introduced a new switch plate that contains a night light that operates without use of bulbs, tubes, filaments or cathodes.

The switch (which consists of a porcelained steel sheet with a ceramic-phosphor coating) sells for around $2.50. Sylvania says the switch plate is good for five years' wear, that operating cost is less than 5¢/year.



Quality is not enough... Atlantic's rule is consistent quality!

The secret—quality control of the entire manufacturing process from basic raw material to the finished product.

Careful control assures *consistent quality* in the entire family of Atlantic Petrochemicals. This means *consistent quality* in your end products or formulations. This means maximum production efficiency and economy with important savings for you.

The members of Atlantic's versatile family are:

THE ULTRAWETS®—superior quality surface-active agents available in bead, flake or liquid form for a full range of household detergent formulations and industrial applications from dispersal agents to air entraining agents to post stabilizers in emulsion latices. Atlantic's Ultrawets offer a wide variety of physical and chemical properties for literally hundreds of applications.

DETERGENT ALKYLATE #2—a raw material for sulfonation to produce quality alkyl aryl sulfonate surface-active agents. It is a blend of alkyl benzenes in which the structure and molecular weight maximize the desirable properties of the resulting sulfonate. The more important of these are wetting ability, detergency, foaming characteristics, reduction of interfacial and surface tension, light color, and freedom from odor.

THE OLEFINS—a group of chemical building blocks which are used to produce such diversified applications as rubber chemicals, surface-active agents, resins, insecticides and germicides.

TECHNICAL EICOSANE—a hydrocarbon with the formula $C_{20}H_{42}$ is a paraffin containing essentially 20 carbon atoms and a low melting point (96.5° F.) and its molecular structure enables it to chlorinate readily, producing compounds of unusual stability having low viscosities with high chlorine content. Some applications are: flameproofing compounds and chemical intermediates for gear lubricants and plasticizers.

ANHYDROUS AMMONIA—a chemical raw material for fertilizers, explosives, for oxidizing agents in the chemical synthesis of plastics, as a source of hydrogen for bright-annealing of stainless steel, and as a source of nitrogen for nitriding alloy steels.

Write, wire or call The Atlantic Refining Company for full information on Atlantic Petroleum Chemicals and valuable details on their application.

Philadelphia • Providence • Charlotte
Chicago • Los Angeles

In Canada: Naugatuck Chemicals Division of Dominion Rubber Company, Ltd.

In Europe: Atlantic Chemicals SAB, Antwerp, Belgium

In South America: Atlantic Refining Company of Brazil, Rio de Janeiro

ATLANTIC PETROLEUM CHEMICALS

THE ATLANTIC REFINING COMPANY

Colorado
...CENSUS-PROVEN OUTSTANDING NEW INDUSTRIAL MARKET

Census-proven one of the fastest growing states in the nation ...survey-proven one of the outstanding new industrial markets, Colorado offers new industry *Profits with Pleasant Living.*

Discover the new markets and opportunities awaiting your company in Colorado. "Site-See" Industrial Colorado now...right at your desk.

Send for Free Executive Portfolio
"INDUSTRIAL COLORADO"

Newly revised 9-booklet portfolio with up-to-the-minute data on Colorado's industrial sites, assets, opportunities and weekend vacation wonderlands. All inquiries held confidential.

COLORADO DEPT. OF DEVELOPMENT
22 STATE CAPITOL • DENVER 2, COLO.

ELIMINATE SEEDING

To make a hard, skid proof wax base for emulsion floor finishes—use a mixture of 80% Polyethylene and 20% Shanco W-1119 — result — homogeneous emulsions free from seeds.

Emulsifiable Polyethylene is excellent for floor finishes but —it is hard to disperse and it mars readily.

Shanco W-1119 exhibits very low viscosity near its melting point. At room temperature it is very hard.

Try a mixture of 80% Polyethylene and 20% Shanco W-1119. You will find that you can make homogeneous emulsions—free from seeds and have a hard, skid proof wax base for your emulsion floor polishes.

Your name and address and we'll send you THE SHANCO MESSENGER each month.

SHANCO
Plastics & Chemicals Inc.
TWO MILE CREEK ROAD • TONAWANDA, NEW YORK

tage of 200 is that it is particularly effective in fully automatic softeners, which need no servicing and no adjustment by owners. About 50% of the softeners are now automatic, and next year the industry expects 75% to fall in this category. (Another 35-40% of the units are semiautomatic —the householder can regenerate the unit himself; about 10% are manual, requiring a serviceman to exchange tanks.)

Whether renting or direct selling is the best way to saturate the water-softening market remains to be seen. It is evident, though, that the equipment makers are trying to find a way to stimulate their industry. They forecast sales of 450,000 units this year and that the number of softeners sold between 1960 and 1970 will be doubled each year.

For resin makers this means a handy, $5 million in sales this year. And with little or no effort on their part, their market may well double every year for a decade.

Nonfarm Fertilizer

A few details about a new type of fertilizer for home and garden use (*CW, Oct. 1, p. 53*) have been revealed by W. R. Grace's Davison Chemical Division. The product, as yet unnamed, is based on a magnesium ammonium phosphate base, has potash and trace element compounds added.

For home gardeners, the fertilizer's big plus is that it is nonburning—there's little danger from overapplication or insufficient watering.

For commercial growers the key selling point is the product's slow controlled-release rate, as well as the low burning hazard. In a typical application, such as reforestation, the fertilizer could be applied to trees at the time of planting and provide enough plant food for two or three years. A 1-lb./tree dosage would be required—¼ lb./tree is the conventional fertilizer dose. The larger dosage cuts down the frequency of fertilizer application, according to Grace officials.

Sales of the product will be made to the approximately $200-million/-year nonfarm fertilizer market through retail outlets such as hardware and garden supply stores, via yet-to-be-selected firms.

Rivals for Radium

New England Nuclear Corp. (Boston) has set up a new division, called the Luminous Products Division, to exploit the use of self-luminous products such as tritium, promethium-147 and krypton-85. The company is especially interested in marketing tritium, which the Atomic Energy Commission says it proposes to exempt from licensing, allowing it to be used on watch dials.

The company plans to sell the radioactive tritium under the name Tri-Glo. It obtains tritium in gas form from AEC's Oak Ridge, Tenn., laboratories. The tritium is mixed with a plastic and combined with zinc sulfide, a phosphor. The tritium excites the phosphor, which gives off the glow-in-the-dark effect. New England Nuclear claims that tritium glows twice as bright as radium and that the beta-emitting material is considerably safer.

Entry of New England Nuclear into the field should step up considerably the activities in radioisotope products. Recently, Minnesota Mining reported its development of Micro-Spheres, isotopes encapsulated in ceramic spheres ranging from 10 to several hundred microns.

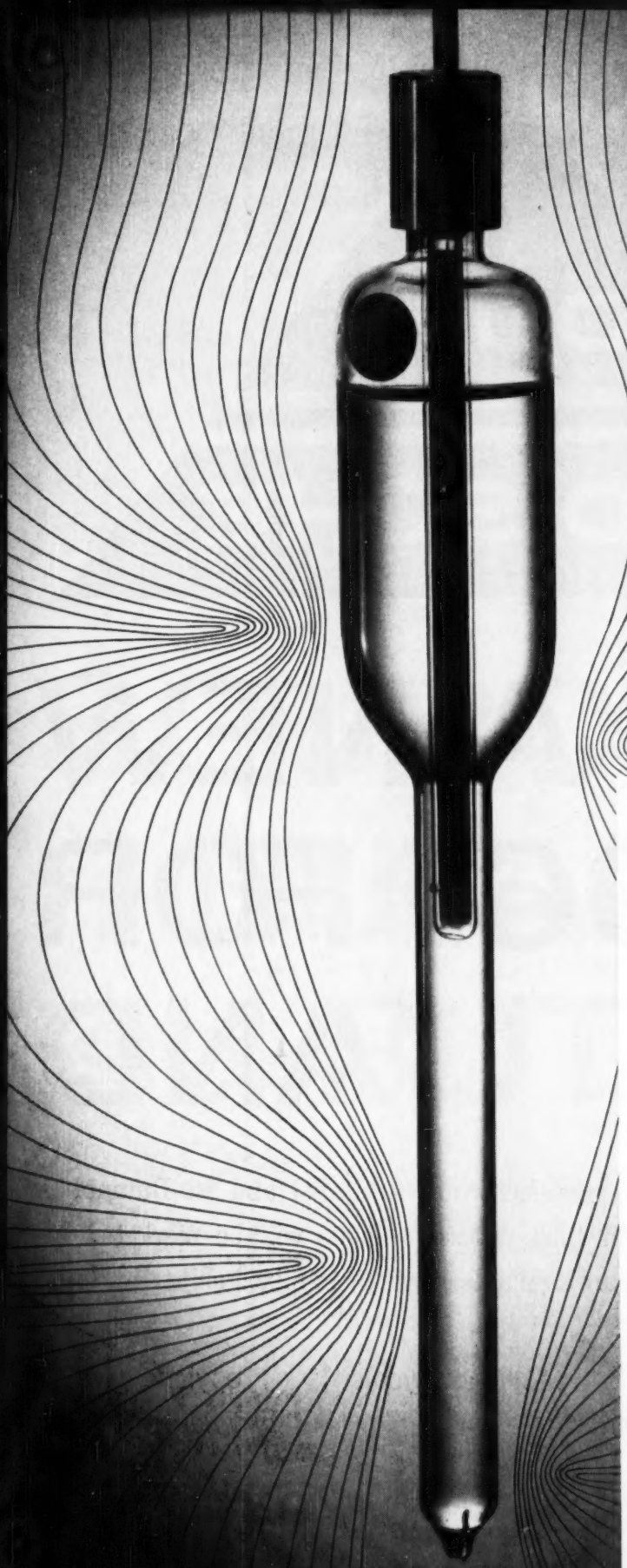
New England Nuclear's marketing activities will primarily be with tritium; 3M apparently is looking toward the marketing of a much wider range of radioisotopes.

New Leaps for Lever

Lever Bros. (New York) is making a splash on the specialties scene with a string of new products either just going into test market or one pace behind.

Reward, Lever's new "all purpose" liquid household detergent will be tested in Rochester, N.Y., and Des Moines, Ia., this week. A companion to Lever's Handy Andy, Reward differs from Handy Andy in that it contains ammonia. The product is advertised as designed for specific cleaning jobs—e.g., woodwork and floors. Two glass bottle sizes are offered, one at 39¢ (15 oz.), the other at 69¢ (28 oz.).

Also in the detergent line, Lever is now trying out Vim, a heavy-duty, low-sudsing laundry detergent in tablet form. (Procter & Gamble has for some time been testing a similar prod-



pH under pressure...high or low pressure, hydrostatic head...Beckman Reference Electrodes are the very heart of superior pH measuring systems *under pressure extremes.* ⌘ Pressurized reference electrodes open new areas of pH control...in process streams up to 100 psi ...at temperatures up to 212° F...where only hydrostatic pressure is required... for accurate measurements from 0 to 14 pH. A comprehensive line of mountings offers a variety of pH system installations. ⌘ Beckman pH accessories, meters and electrodes are available through leading recorder companies. For detailed information write for Data File 17-43-06

Beckman

Scientific and Process Instruments Division

Beckman Instruments, Inc.
2500 Fullerton Road,
Fullerton, California

INSTRUMENTAL IN YOUR FUTURE 25 YEARS 1935-1960

It's a Fact: **Three separate plug-in components in the Model W Industrial pH Meter allow easy, quick maintenance, even by untrained personnel.**

A NEW
IN 1961 FOR
AND

A new Dow Badische plant for manufacturing n-Butanol and iso-Butanol is scheduled to go on stream late in 1960. These products will be marketed by The Dow Chemical Company and are available singly or in mixed shipments with other Dow products such as—

Dowanol® (Dow glycol ethers) • Ethylene glycols • Propylene glycols
Glycerine • Chlorinated solvents

SOURCE
n-BUTANOL
iso-BUTANOL

Dow Badische is a new company owned jointly by The Dow Chemical Company and Badische Anilin und Soda Fabrik, Overzee, N.V. Dow Badische, initially operating in the field of acetylene chemistry, unites American and European production and research know-how and couples them with American marketing skills. These new alcohols are the first developments for other product lines.

For more information, write to The Dow Chemical Company, Midland, Michigan.

THE DOW CHEMICAL COMPANY, MIDLAND, MICHIGAN

See "The Dow Hour of Great Mysteries" on NBC-TV

DOW

Rare Earths

are doing these jobs in ceramics now

Producing intense and unusually "clean" colors such as yellow, blue and pink for porcelain enamel glazes.

Producing microwave ferrite components for use in isolators, circulators, switches, and phase shifters based on Faraday rotation in circular waveguides.

Producing high neutron opacity cermets and ceramics with desirable daughter reaction products for nuclear control rods.

Producing excellent dielectric ceramic components for high and low temperature applications, and flame-spray coatings for metal components.

Your current program can now include a screening of the many interesting potentials for rare earth oxides because these oxides are readily available in quantity. We shall be pleased to assist you with your application.

Copyright 1960, Michigan Chemical Corporation RE-60-1

RARE EARTHS AND THORIUM DIVISION
MICHIGAN CHEMICAL CORPORATION
684 North Bankson Street, Saint Louis, Michigan

PRASEODYMIUM • NEODYMIUM • SAMARIUM • EUROPIUM • GADOLINIUM • TERBIUM • DYSPROSIUM • HOLMIUM • ERBIUM • THULIUM • YTTERBIUM • LUTETIUM • YTTRIUM

uct called Salvo, on the West Coast.) Cities picked for Lever's trial are Fort Wayne, Ind., and San Diego, Calif. Vim—the name was used several years ago for a powdered laundry detergent that was dropped—is packaged in boxes of 24 (41¢), 40 (69¢), and 128 ($2.15). Each round, light-blue pellet weighs 1 oz. Dosage: 2 tablets in each wash load.

Starlight, a shampoo in "puff" form—a nonwoven fiber pad impregnated with detergent—is currently being marketed in Syracuse, N.Y., and Indianapolis, Ind. When moistened, each puff provides enough suds for two latherings. A separate puff impregnated with hair conditioner, which is moistened and applied after shampooing, may be bought with the shampoo or separately. The flat, 3½-in. square puffs are individually packaged in saran-coated cellophane envelopes inside a laminated foil carton. Six shampoos and six conditioners retail for $1.20.

Other new products on the Lever horizon are pink liquid Swan dishwashing detergent, pine green Lifebuoy soap, and two new variations on Dove soap—in the form of a deodorant soap and a bar called Baby Dove for children.

Internal Tinting

Development of internal dyes for cast CR-39 Hard Resin lenses (those made of allyl resin) is now claimed by the Research and Development Dept. of Pioneer Scientific Corp., a subsidiary of Bausch & Lomb (Rochester, N.Y.). The new dyes replace external colorants. Previously, applying external dyes by dip coating was the only way to tint the lenses.

The new technique will be used by Pioneer to produce six-base plano sunglass lenses (the standard uncorrected type) in both green and gray shades. As well as making lenses for Bausch & Lomb with the new dyes, Pioneer will sell them to other sunglass makers. Price will be 50-60¢ for each set of lenses.

Lenses made with the dyes are said to be more uniform in color than those externally coated. Scratch resistance is also improved, it's claimed.

Although Pioneer won't tell exactly how its tinting process works, it says it is adaptable to the coloring of plastic-welding shield windows.

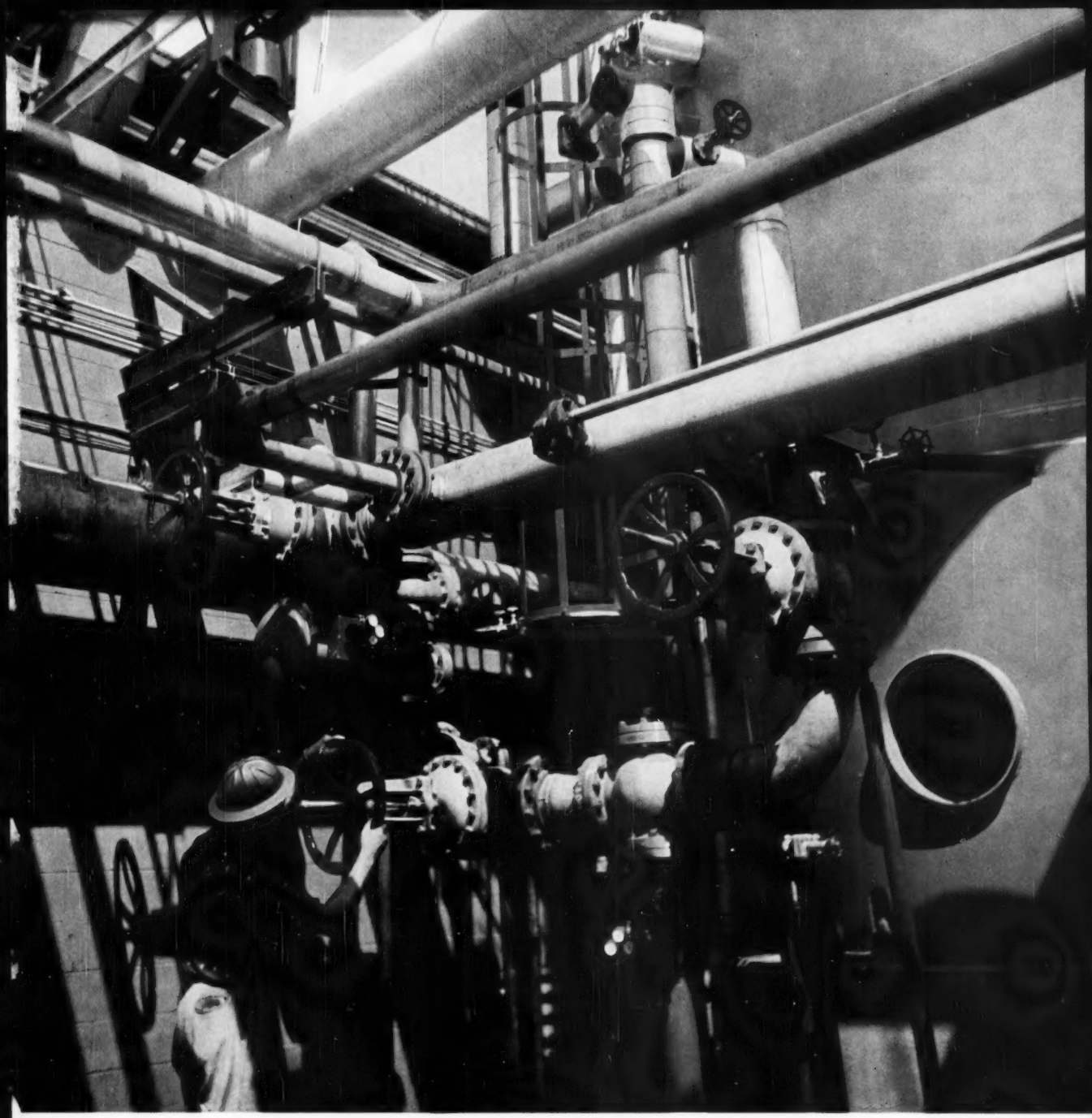


PHOTO ON ANSCOCHROME

SPECIAL PROCESS...General Aniline & Film Corporation's new plant at Linden, N. J., went on stream last year. Built by Scientific Design Co., Inc., it produces ethylene oxide by direct air oxidation of ethylene, Scientific Design's own efficient and economical process. The Aloyco Stainless Steel Valves here (red hand wheels) were selected for their design features and long life expectancy. On your next stainless steel valve job, why don't you talk first to the one company which specializes in high alloy valves exclusively. For further details about Aloyco Valves, write us at 1301 West Elizabeth Avenue, Linden, New Jersey. 9.5

ALLOY STEEL PRODUCTS COMPANY

Boston · New York · Wilmington · Atlanta · Buffalo · Pittsburgh · Chicago · St. Louis · San Francisco · Los Angeles

HOOKER'S NEW CAUSTIC SODA DRUM
FLIPS OPEN, EMPTIES EASIER

You don't need a tool kit to open Hooker's *new* caustic soda drum. Flip the snap-lock and it's open. Flip it the other way and it's closed.

It's easier to get at the soda because the drum has a *full* open head—21 inches across.

The soda pours smoothly when the drum is tipped. There's no rim to catch and hold it; no waste.

The improved seal keeps out moisture, too.

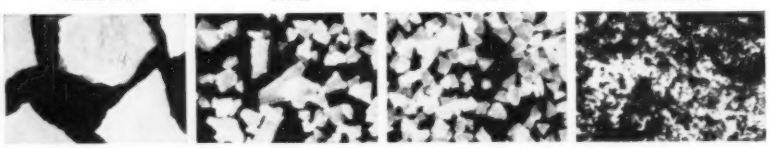
Since the drum mouth is bigger, it's easier to re-use the drum after it's empty.

Yet this 400-450-pound capacity drum is standard. There's no price boost or premium. It's another advance from Hooker, who first supplied 18-inch-mouth drums as standard.

Nevertheless, the contents are still your prime concern. Hooker's caustic soda is of uniform quality. Flake thickness and size don't vary from batch to batch.

Hooker's caustic soda is available in four sizes: regular, fine, crystal and granular. Specify flake size when ordering.

REGULAR FINE CRYSTAL GRANULAR



HOOKER CHEMICAL CORPORATION

710-2 FORTY-SEVENTH STREET, NIAGARA FALLS, NEW YORK

HOOKER CHEMICALS PLASTICS

Technology
Newsletter

CHEMICAL WEEK
October 22, 1960

Continental Oil's Anotrol corrosion protection system (*CW, Aug. 27, p. 91*) will be used to cut capital costs at the company's new Alfol (C_8 to C_{40} straight-chain alcohols) plant to be completed next year at Lake Charles, La. (*CW Business Newsletter, Aug. 29, '59*). By anodically protecting tanks for the sulfuric acid hydrolysis step, Conoco will be able to substitute mild steel for more expensive stainless steel, which would ordinarily be used to prevent product discoloration caused by iron pickup.

Conoco answers industry's fear that the system won't offer foolproof corrosion protection by pointing out that the only major problem in the past 26 months has been failure of reference electrodes. Conoco will solve this problem by doubling up on electrodes in the Alfol installation.

Minneapolis-Honeywell's Rubicon Division (Philadelphia), which will market the Anotrol system under Conoco license, still won't discuss costs. But it says it is modifying the system to bring costs down, will be ready to put regular production units into the field in first-quarter '61—and will have costs ready then. Major use for the Anotrol system now appears to be in applications similar to Conoco's—where users of sulfuric acid and oleum can't tolerate product contamination from iron pickup. About 10% of the sulfuric acid production is estimated to be in this category.

•

Hyper-pure silicon may soon be finding new competition in semiconductors made from pure silicon carbide. Westinghouse Electric Corp. has been making transistors of this material, working under sponsorship of the Air Force Cambridge Research Laboratories. The silicon carbide transistor is capable of operating at temperatures above 650 F, compared with 400 F for silicon and 200 F for germanium.

In contrast with bipolar silicon and germanium transistors (*CW, July 16, p. 60*), the silicon carbide transistor is unipolar, uses no third voltage to accelerate the electrons but acts like a diaphragm pump, "squeezing" them along. It is made from crystals containing less than one part impurity in 10 million parts of silicon carbide (hyperpure silicon deals in parts per billion) by exposing crystals to vaporized aluminum at about 3900 F.

Planned for initial use in aircraft and space vehicles, the new transistor is only about 0.080 in. by 0.040 in. in size, with a surface smaller than the head of a pin.

•

A new executive plan for industrial researchers is advocated in a Princeton University report out this week. "The Scientist in American Industry" was written by sociologist Simon Marcson, a research associate

in the university's industrial relations section. Marcson believes industrial scientists respond better to management by fellow professionals, suggests a blend of "colleague authority" (typical of universities) with industry's "executive authority."

•

The key to Shell Chemical's isoprene manufacturing process is suggested in a new Australian patent (No. 57725/60): common processing zones for both isoprene and butadiene. According to scientists of the Institute Francais du Petrol, the main disadvantage of the direct dehydrogenation route (known to be Shell's) has been the difficulty of economically separating isoprene products.

•

A new dry-photography technique was unveiled by Horizons Incorporated (Cleveland) at last week's Washington symposium on high-speed photography sponsored by the Society of Photographic Scientists and Engineers. The new system, reported by R. H. Sprague, uses the reaction of aryl amines with free radicals generated from multihalogenated compounds (e.g., carbon tetrachloride) by near-ultraviolet light. Result is a direct print-out dye image. The new technique holds the possisibility of being 10-20 times faster than diazo methods, yet requiring simpler equipment. Sprague emphasized that the work is still in the research stage and that questions such as image permanency have yet to be answered.

•

A better shark repellent may result from Navy research on a poison given off by the "sea cucumber" fish. The marine creature secretes a toxic substance called "holothurin" to protect itself from natural enemies. Holothurin may also have medical uses. It has nerve-blocking properties, increases blood clotting time, and has stopped tumor growth in white mice. Research on the chemical is being carried out at The New York Zoological Society, Mt. Sinai Hospital (New York) and the Naval Medical Research Institute (Bethesda, Md.), all under the sponsorship of the Office of Naval Research.

•

Establishment of an "International Tropical Research Institute" for Central and Latin America was proposed by Jesse Hobson, vice-president and director of research for United Fruit of Boston, at the annual meeting of Southwest Research Institute in San Antonio last week.

The institute, a proposed nonprofit research organization devoted to problems of tropical areas, would be entirely independent and separate from any private company and independent of governments, except those that might become clients. Purpose: to help supply vital research leadership, skills and energies to stimulate new ideas and enterprise for enriching economies of tropical regions. It would first tackle the agricultural problems, later the industrial ones.

Hobson suggests that the institute have a broad-scope, versatile staff patterned after that of Southwest Research Institute in San Antonio, which serves both these fields.

UNITED STATES BORAX & CHEMICAL CORPORATION

Adopts This New Abbreviated Form of Identification...

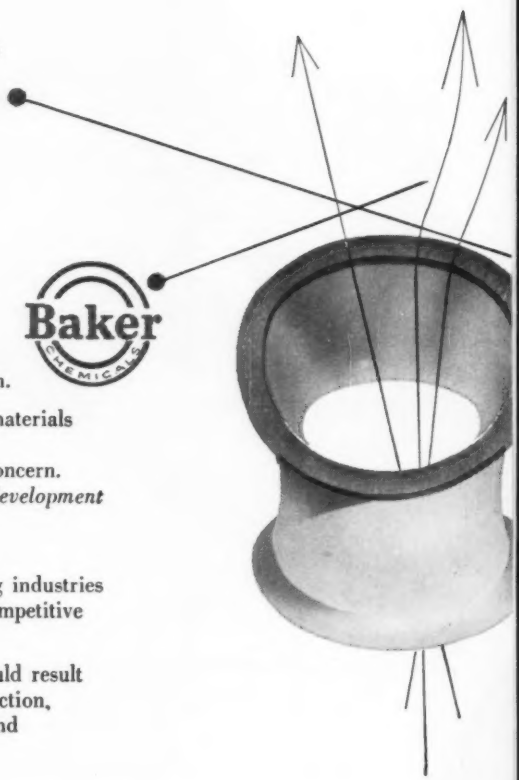
U.S.BORAX

We have not changed our name; we have merely shortened it for your convenience. You have helped us arrive at this decision by your repeated usage of this abbreviated form in lieu of our full corporate name. Now the shortened version becomes official for all purposes other than legal matters. It's U. S. BORAX . . . your most dependable source of supply for borates, boron chemicals and potash.

U.S.BORAX 630 SHATTO PLACE · LOS ANGELES 5, CALIFORNIA

BAKER PROCESSING CHEMICALS...

"...the purity and uniformity of your product...made possible important purchasing and processing economies."



THE CONQUEST OF THE REFRACTORY METALS—such as tantalum, tungsten and molybdenum—represents a triumph of modern metallurgical science. Inseparable from the story of their development is the name Fansteel Metallurgical Corporation.

As Fansteel points out in their letter opposite, proper starting materials are particularly important in their processing. To quote:
"The quality of the molybdic oxide we use is of the greatest concern. *The purity and uniformity of your product made possible the development of important purchasing and processing economies.*"

This letter is a matter of great personal pride to us at Baker. For many years Baker has supplied many of America's leading industries with precision industrial chemicals in tonnage quantities at competitive prices—firms like Fansteel who insist on the finest.

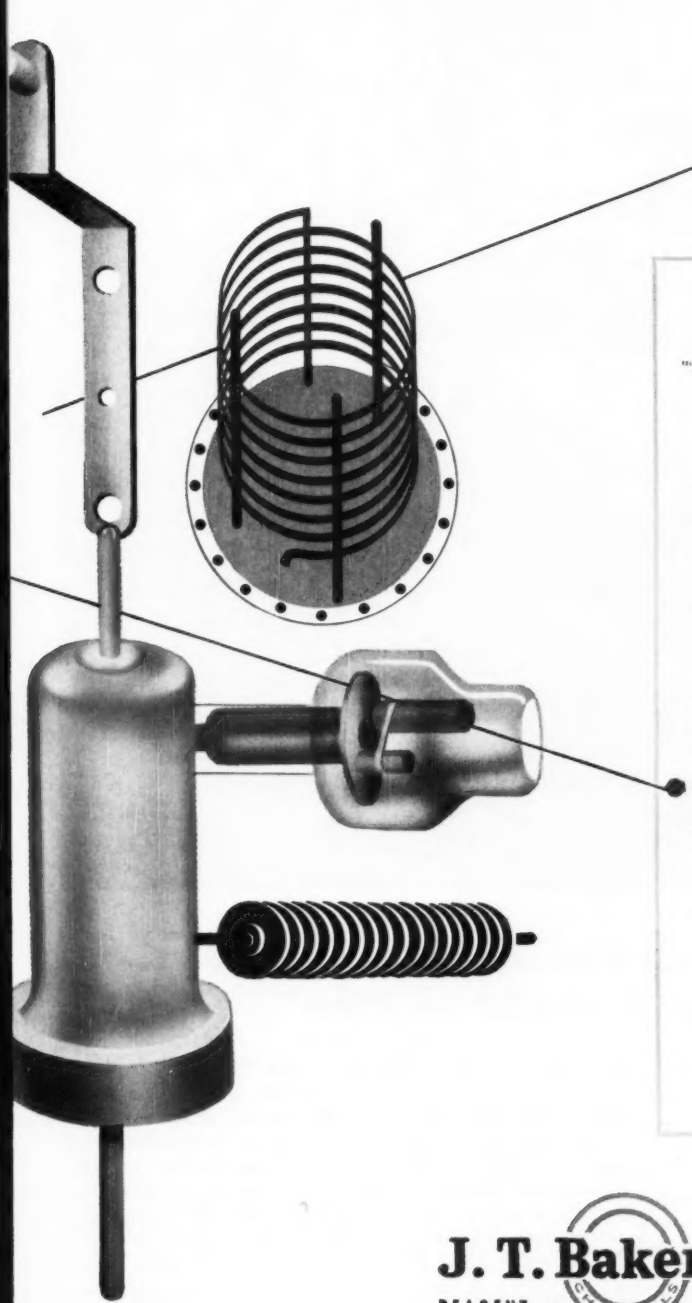
Perhaps a change in your present procurement procedures would result in less work for *your* laboratories, greater continuity of production, a feeling of increased satisfaction, and important purchasing and processing economies.

Baker *Purity by the Ton* may provide the key.

We would be glad to cooperate in a study of the ways Baker industrial chemicals might be used to advantage in *your* organization. Needless to say, we will always consider your trademark as precious as our own—and safeguard it with equal vigilance.

PURITY BY THE TON—

one of the guardians of this precious trademark



FANSTEEL METALLURGICAL CORPORATION

An Industry that Serves Industries

NORTH CHICAGO, ILLINOIS, U. S. A.

Mr. Warren F. Schumacher
Sales Manager
Fine & Industrial Chemical Division
J. T. Baker Chemical Company
Phillipsburg, New Jersey

Dear Mr. Schumacher:

The production by Fansteel of refractory metals, such as tantalum, tungsten and molybdenum, is recognized as one of America's basic industries. Particularly important to us is molybdenum, which we refine to the pure metal from the type of molybdic oxide you supply.

The quality of the molybdic oxide we use is, therefore, of the greatest concern. It is the high purity and uniformity of your product lot after lot which made possible the cooperative effort between your firm and mine, resulting in the development of important purchasing and processing economies. This is equally true for the other raw materials you supply us.

Your system of precise manufacturing controls, plus your accurate testing and thorough blending, permit us to process lots of molybdic oxide many times larger than before. This has greatly reduced our testing time -- and one pilot run now takes the place of five. The estimated annual savings run into many thousands of dollars.

The result has been more economical use of equipment, less work for our chemical and metallurgical laboratories, greater continuity of production, and a feeling of increased satisfaction.

Sincerely,

Joseph A. Teece

JOSEPH A TEECE
Vice-President
Director of Purchases

JAT:H

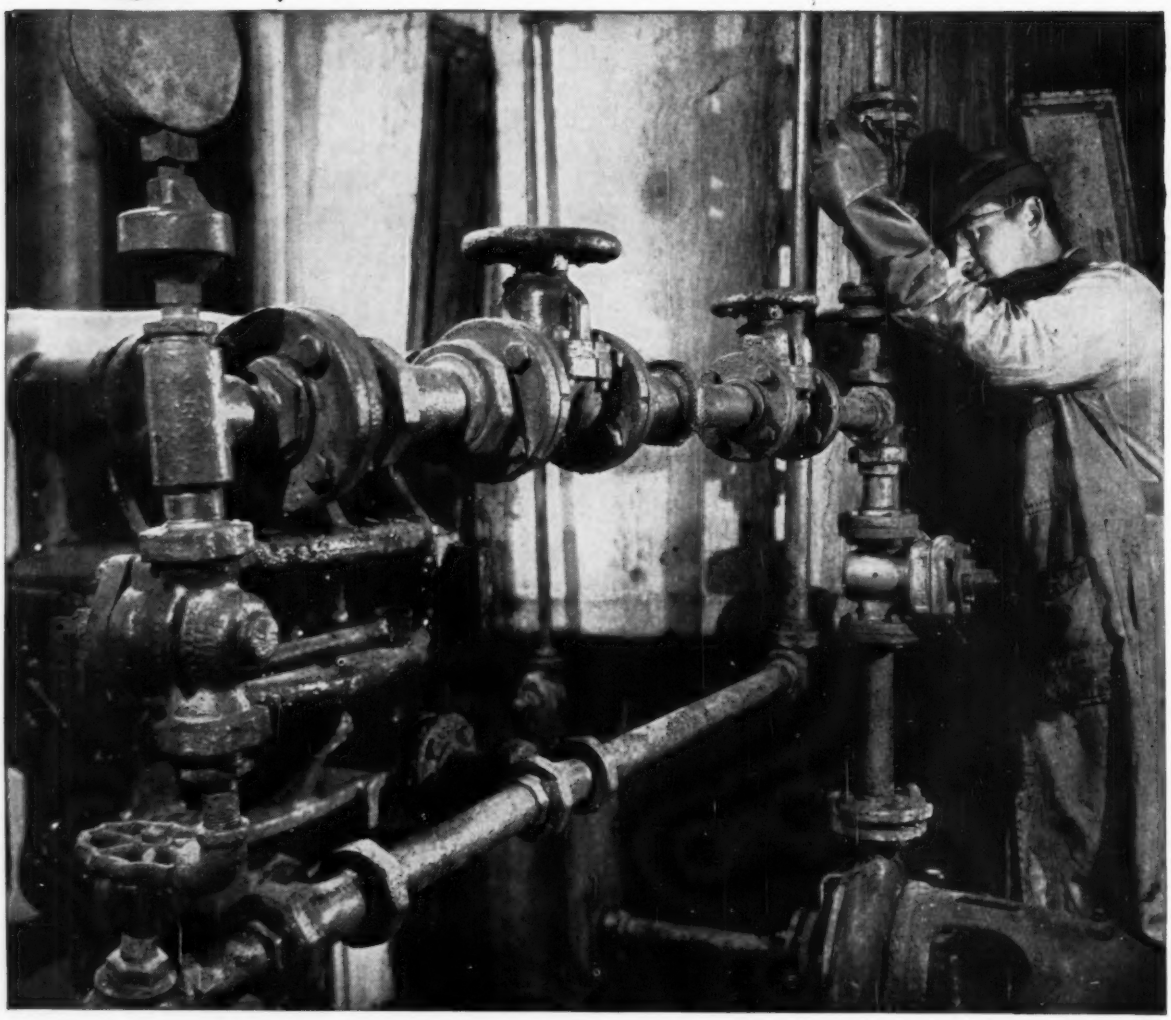
J. T. Baker Chemical Co.

REAGENT • CHEMICALS • FINE • INDUSTRIAL

Phillipsburg, New Jersey

FOR PRODUCTION USE

DOW | **SARAN LINED PIPE**



After eight years carrying lithium chloride brine . . . No Corrosion in Saran Lined Pipe

When pipe must carry extremely corrosive lithium chloride brine . . . when floor-level installation freely exposes it to danger of accidental damage from trucks and tools . . . doubly protective Saran Lined Pipe can mean dependable, low-maintenance operation for many years.

Lithium Corporation of America's Minneapolis, Minnesota, plant produces pure lithium metal as well as various lithium salts. In the production of lithium chloride, Saran Lined Pipe is used to carry LiCl brine to drying equipment for the removal of water. This brine is extremely corrosive and will quickly eat through steel pipe should a crack develop in the lining. Other Saran Lined Pipe carries suspensions of lithium fluoride and hydrofluoric acid, a combination which will attack and destroy even glass. Because of its strength and extreme corrosion resistance, there's never been a failure in the Saran Lined Pipe.

Saran Lined Pipe at this plant is installed close to floor level in some working areas, constantly exposed to the danger of accidental damage from trucks and tools. Lithium's engineers stated, "Saran Lined Pipe provides protection from outside damage and from corrosion by the solutions carried. In eight years of pumping LiCl brine through Saran Lined Pipe at 30 to 50 psi, there's never been a breakdown, and very little maintenance was required."

Saran Lined Pipe, fittings, valves and pumps are available for systems operating from vacuum to 300 psi, from below zero to 200° F. They can be cut, fitted and modified easily in the field, without special equipment. For more information, write Saran Lined Pipe Company, 2415 Burdette Avenue, Ferndale, Michigan, Dept. 2280AM10-22

See "The Dow Hour of Great Mysteries" on TV.

THE DOW CHEMICAL COMPANY • MIDLAND, MICHIGAN

SALES AND DISTRIBUTION

New Gain in Gas Piping

New idea in gas distribution: a multiproduct, multicustomer pipeline system to radiate from Linde's planned Deer Park, Tex., plant. Possibility: cheaper oxygen, nitrogen for Houston area.

This week Union Carbide's Linde Co. unrolled plans for a huge air separation plant and pipeline distribution system along the Houston Ship Channel.

Admittedly, Linde's plans are not yet complete, and contracts for the plant and pipeline have not yet been let. And, since it is still wooing customers in the Houston area, Linde withheld official comment as long as possible, despite mounting industry talk of the firm's plans (*CW Business Newsletter, Sept. 3*).

Here's how the puzzle currently seems to piece together: Linde will build a large oxygen-nitrogen plant at Deer Park (adjacent to Diamond Alkali's proposed acetylene plant) to supply customers by pipeline within a fairly extensive area—estimated to be up to a 25-mile radius. Capacity: "at least" 500 tons/day and perhaps as much as 1,000 tons/day of high-purity oxygen; nitrogen capacity: 800 tons/day. Linde is noncommittal about the air plant's cost, but industry figures it at roughly $5 million.

But the most significant aspect of Linde's project is the new pipeline system it will build to carry the gases to users.

According to the company, the system will be the first multiproduct, multicustomer pipeline system for industrial gases. Linde is betting it will be substantially cheaper to operate a single, centralized plant to serve several customers than to put up several small, on-site plants. However, Linde offers no comment about whether these economies may affect the selling price of its oxygen or nitrogen.

Hot Sales Race: Actually, Linde wasn't the only firm eyeing the ship channel area with oxygen in mind. Both Air Products (Allentown, Pa.) and Houston's Big Three Welding Equipment Co. have sought to sign up local oxygen customers in recent months. First sign of Linde's victory: Diamond's late-August report of a PVC expansion and acetylene project.

But Big Three will go ahead with plans to put up a small oxygen-nitrogen plant in nearby Orange, will pipeline both gases to customers nearby. Big Three will turn out over 17 tons/day each of liquid oxygen and nitrogen, will also produce 90 tons/day of gaseous nitrogen.

Big Three claims its nitrogen will be 99.999% pure, notes also, as does Linde, that pipeline nitrogen should cost about 20% less than any other kind. Already the company has plans to install five miles of 5-in. pipe for the nitrogen line, may lay up to 3½ miles of oxygen pipeline. One difficulty: Big Three has yet to sign up one oxygen customer in the Orange area. There are, of course, plenty of prospects. Nearby firms include Firestone, Du Pont, Allied Chemical, Spencer and Goodrich-Gulf.

Multicustomer Pipeline: Although Linde is still uncertain about the capacity of its proposed air separation plant—it likely will expand the design capacity if additional customers are lined up within several months—the company takes pains to point out the significance of its novel distribution system. According to the company, the new system represents the latest step in the long evolution of industrial gas distribution methods—from cylinders and cascade units, to liquid storage and transport, to on-site plants, and now to large central production sites connected by pipeline with customers.

Linde believes its key economy of operation lies in its having a number of customers—which will allow it to smooth out peaks and troughs in demand.

According to Linde, customers near its plant will now be able to get oxygen or nitrogen without investing ad-

VERSATILE, POWERFUL DISPERSING AGENTS

LOMAR®

series of naphthalene sulfonic acid condensates

The Lomar series supply the powerful dispersing properties required to handle dyes, pigments, clays, graphite, mica, carbon black, and other inert powders. They improve manufacturing processes as well as finished products in fields involving:

Cement
Plaster
Ceramics
Wet milling
Paint and asphalt emulsions
Pitch and slime control in papermaking
Preventing coagulation in latex
Foundries
Tanning

New! We have just published a booklet on the Lomar series. It contains full information on this valuable line of dispersing agents. Send for a free copy today.

JACQUES WOLF & CO. Chemicals Newark, N.J.

A SUBSIDIARY OF NOPCO CHEMICAL COMPANY

Clifton, N.J. • Carlstadt, N.J. • Los Angeles, Calif.

Does Paperwork give You the Willies?

STOP QUIVERING! No need to take an axe to the office typewriters just because we mentioned that nasty word. There's nothing tricky about solving your problem of being overworked and "over-read." We can fix you up in the next paragraph . . . if you'll just remember you're a chemical process management man and stop making like a librarian.

HOW SO? SIMPLE! If you're a regular subscriber to CHEMICAL WEEK, rely more on the magazine to sift that mountain of reports cluttering up your desk. Read it promptly, more intensively and you'll be way ahead in time and knowledge. If you're a casual "pass-along" reader, it'll pay you to get your own personal copy . . . and read it while the news is fresh!

LET CHEMICAL WEEK DO IT . . . collect the important economic and technical data for you . . . report the hot happenings affecting your job specialty . . . give you all the chemical process news and events worth printing . . . *regularly handle your paper work headaches.*

ALL IT TAKES is a few minutes of your time each week . . . and $3.00 for a full year's service, $5.00 for 3 years. If you're a management man (department head or above), you should be reading CHEMICAL WEEK, *every week!* Order now from:

Subscription Manager,

Chemical Week

330 W. 42nd St., New York 36, N. Y.

ditional capital. But it seems more likely that potential customers are eyeing Linde's new system with thoughts of less-costly gas. Since the prices are negotiated directly, Linde has so far not commented on gas prices.

Linde now has firm plans to construct 8 miles of dual pipeline (separate lines for each gas). Houston area observers report that nearly 20 miles of line have been projected, however. Linde backs this report somewhat, in a public statement that its system will eventually cover a "much more extensive area" than the 8-mile pipeline will serve.

On the line now firmly planned are Diamond Alkali—its acetylene plant will take 320 tons/day oxygen, 105 tons/day nitrogen—and, 5½ miles away, the Houston Works of Armco Steel's Sheffield Division—it will need some 140 tons/day oxygen.

Meanwhile, Linde is busy trying to line up additional customers before it freezes plant design. Its main hope for the success of the novel distribution system: estimates that by '70, the oxygen market in the ship channel area may be 2,000-2,500 tons/day. And Linde wants to supply the big share of that.

New Coast Terminal

A new deepwater chemical terminal has just been opened on the West Coast. It's the Vancouver terminal of McGuire Chemical Co. (Oakland, Calif.).

The new, $500,000 facility is the third deepdwater chemical terminal operated on Pacific waters by McGuire. The others: the San Pedro terminal, serving the Los Angeles district, opened in May '57; the Central terminal and main office, in Oakland, serving the San Francisco area. This was opened in June '59. McGuire's total storage capacity in all three terminals: nearly 13 million gal.

McGuire doesn't produce or sell any chemicals; its service consists of storage, mixing, blending, testing and packaging them. It can supply chemical products ranging from antifreeze and automotive specialties to motor oils.

All three terminals have loading bays for handling trucks and tank cars.

The Vancouver operation will be headed by Earl McCluer, newly appointed vice-president.

DATA DIGEST

• **Custom Synthesis:** New catalog describes production chemicals and custom facilities available to handle problems in organic chemical synthesis. Formulas and molecular structure diagrams are included for 65 production chemicals and 67 chemicals in the developmental stage. Elanco Products Co., division of Eli Lilly & Co. (Indianapolis 6, Ind.).

• **DMF and DMAC:** New booklet describes catalytic and synthetic applications for dimethylformamide (DMF) and dimethylacetamide, including 183 literature references. E. I. Du Pont de Nemours & Co., Inc. (Wilmington 98, Del.).

• **Epoxy Flooring:** New brochure tells about a new terrazzo-type flooring that uses epoxy resins instead of cement. Durazzo, Inc. (623 River Rd., Garfield, N.J.).

• **Molding Linear PE:** Illustrated booklet outlines injection molding of linear polyethylene. Information includes general properties, molding problems, special techniques and applications. Another folder (50 pages) describes extrusion blow-molding operations, including properties and specifications. Hostachem Corp. (270 Sheffield St., Mountainside, N.J.).

• **Revised Handbook:** Redesigned booklet describes properties, formulas and other information for organic solvents and chemicals. Index and tables cover some 150 products. Chemical Solvents, Inc. (60 Park Pl., Newark 2, N.J.).

• **Resin Review:** Latest edition of periodical lists advances in oil epoxide plasticizers, acrylic emulsion paints, ion-exchange resins, and improvements in press coatings for paper. Resinous Products Division, Rohm & Haas Co. (Philadelphia 5).

• **Flameproofing Literature:** Bibliography lists information published on applications of antimony trioxide as a flame and fire retardant material. Domestic and foreign patents are included as well as books and periodicals. Metal & Thermit Corp. (Rahway, N.J.).

• **High-Strength Bronzes:** New bulletin lists specifications, compositions, properties and uses of a series of copper-base alloys for use in the metalworking and chemical process industries. Ampco Metal, Inc. (Box 2004, Milwaukee 1, Wis.).

last year over 100 firms lowered their multiwall bagging costs through UNION-CAMP'S

PACKAGING MACHINERY

another FREE service of the ★ Star Packaging Efficiency Plan!

More efficient packaging machinery is just one feature of the 5-Star Plan. Yet it has helped over 100 companies lower their multiwall bagging and handling costs. All within the last two years!

A midwest packer—by following recommendations made by UNION-CAMP packaging engineers—speeded his bagging rates and saved $48,500. A southern multiwall user now enjoys similar economies. As a result of a 5-Star Plan survey, he installed a UNION I & C Bagger. The new unit cut his labor expense 60 per cent.

For many other firms, installing automatic I & C Acto-Cutters on bagger sewing heads has reduced bagging crews by as much as a third.

The 5-Star Plan offers you impressive money-saving opportunities regardless of the size of your operation. Besides packaging machinery this comprehensive service covers bag design, bag construction, specifications control and a detailed survey of your plant.

And it's free!

UNION-CAMP®
MULTIWALL BAGS

Union Bag-Camp Paper Corporation · 233 Broadway N.Y. 7, N.Y.

★ BAG DESIGN · BAG CONSTRUCTION · SPECIFICATIONS CONTROL · PACKAGING MACHINERY · PLANT SURVEY

GLC ANODE CUSTOMERS NOW BENEFIT FROM THE RESULTS OF OUR RESEARCH

As suppliers to major chlor-alkali producers here and abroad, it is part of our responsibility to employ the most modern research and development techniques in the constant improvement of GLC anode quality.

Our customers are now reaping the rewards of past explorations in terms of economical performance markedly superior to the standards of yesteryear.

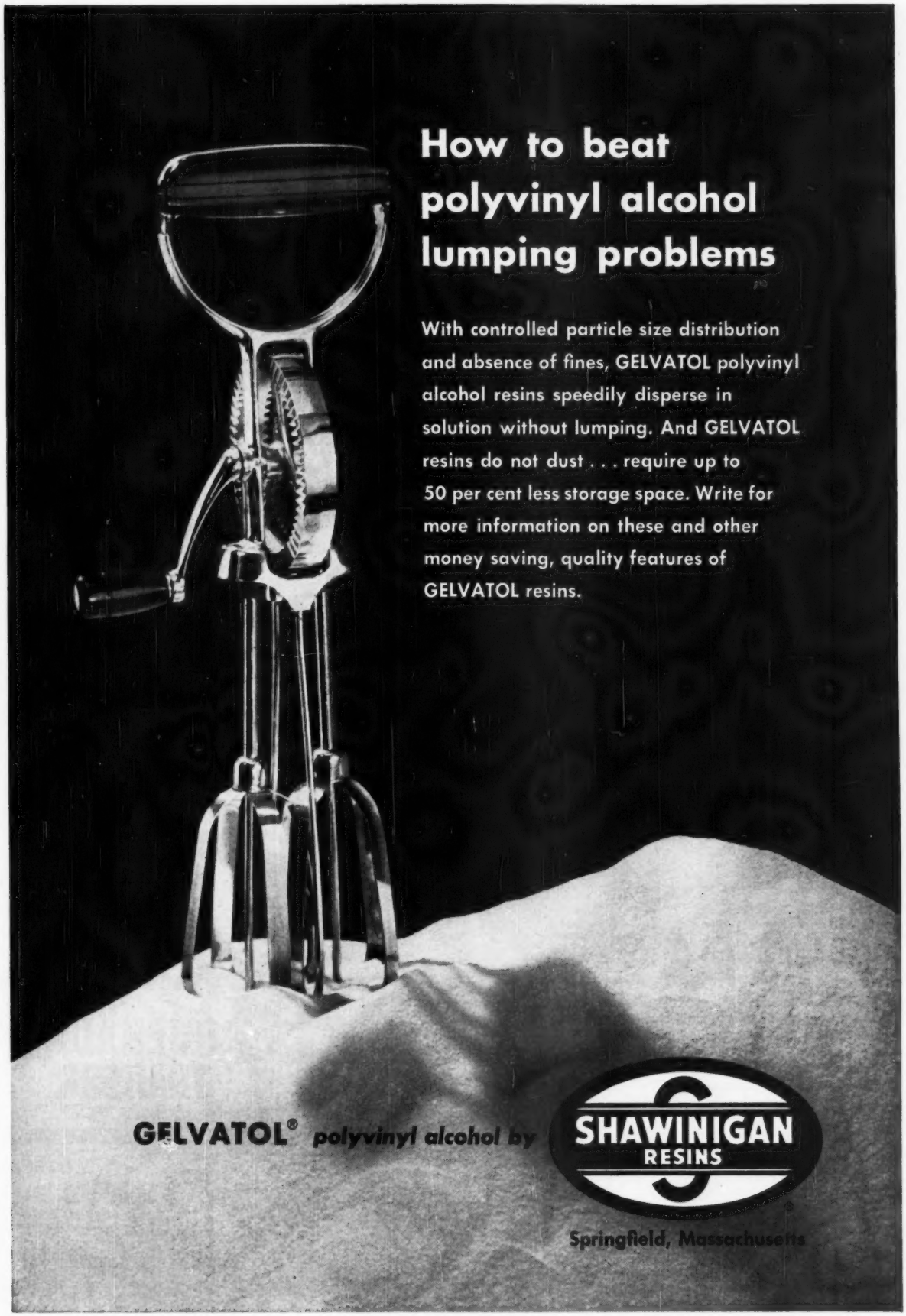
Electrolytic cell operators, from their own experience, are becoming increasingly aware of the superior performance of GLC custom made anodes—a superiority that becomes even more marked at high current densities.

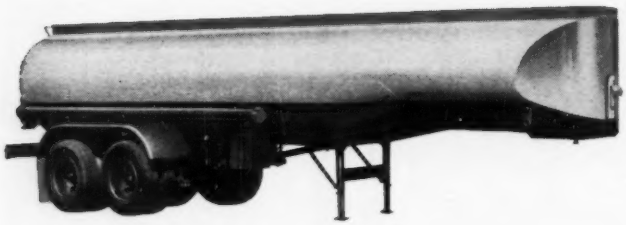
Our special anode production and research facilities have as their goal still better quality and higher performance characteristics for the GLC anodes of the future. In this way we hope to merit an increasingly important role in our partnership in your progress.

PRODUCTS ELECTRODE GLC DIVISION YOU CAN TRUST ®

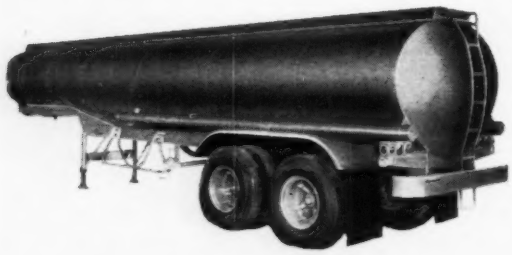
GREAT LAKES CARBON CORPORATION

18 EAST 48TH STREET, NEW YORK 17, N. Y. OFFICES IN PRINCIPAL CITIES

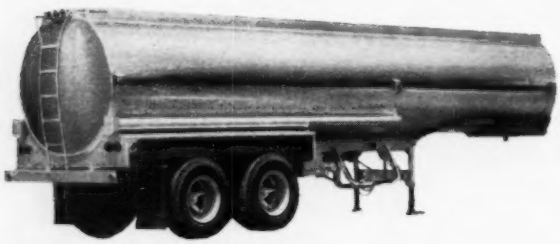

How to beat polyvinyl alcohol lumping problems
With controlled particle size distribution and absence of fines, GELVATOL polyvinyl alcohol resins speedily disperse in solution without lumping. And GELVATOL resins do not dust . . . require up to 50 per cent less storage space. Write for more information on these and other money saving, quality features of GELVATOL resins.
GELVATOL® polyvinyl alcohol by
SHAWINIGAN RESINS
Springfield, Massachusetts



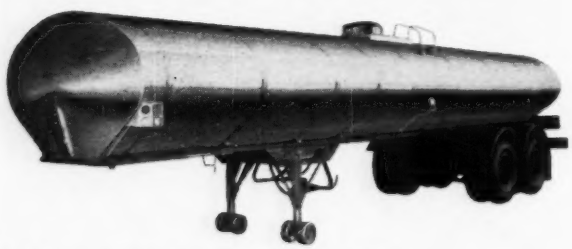
Featherweight Steel Flammable Tank-Trailer
—for hauling gasoline, benzine, alcohol, and solvents.



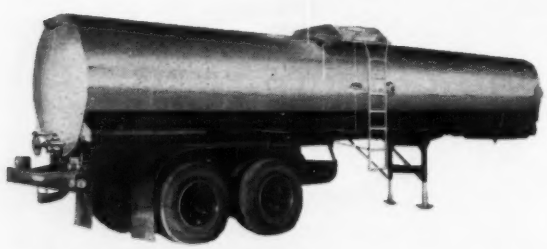
6200 Series Steel Petroleum Tank-Trailer
—for hauling gasoline, kerosene, benzine, lubricating oils, alcohol, solvents, diesel fuel, and aviation fuels.



7100 Series Aluminum Tank-Trailer
—for hauling gasoline, chemicals, fertilizer, kerosene, benzine, lubricating oils, alcohol, solvents, diesel fuel, and aviation fuels.



Stainless Steel Insulated Sanitary Tank-Trailer
—for safe transportation of edible products such as vegetable oils, water, salt solutions, vinegar, liquid sugar, yeast, dextrose, etc.



Insulated Hot Materials Tank-Trailer
—for transporting hot materials such as tallow, tar, asphalt, paraffin, molasses, hot oil, wax, pitch, resin, and glue.

Which Fruehauf Tanks Can You Use In Your Business ?

FRUEHAUF TRAILERS

If It's A Fruehauf,
You Get More—
So You Pay Less

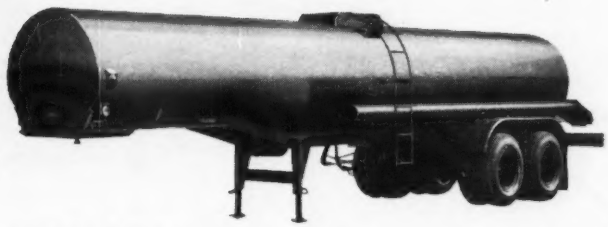
Flammables . . . bulk commodities . . . chemicals . . . edible cargoes . . . asphalt . . . whatever your product, Fruehauf has the world's broadest line of liquid and bulk transporters to meet your hauling needs.

For over 45 years, Fruehauf engineers have been designing and producing superior Truck-Trailers to meet the constantly changing requirements of professional haulers, whose sole source of income comes from the equipment they operate.

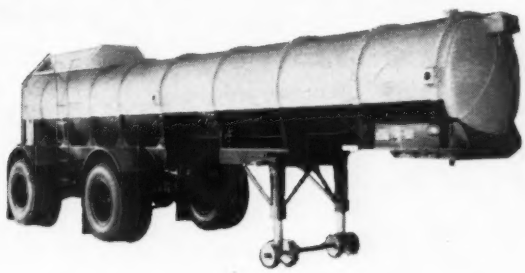
At Fruehauf's four large, modern tank production centers—Fort Wayne, Indiana, Fresno, California, Omaha, Nebraska, and Uniontown, Pennsylvania—Tank-Trailers are being produced to rigid quality control standards for a multitude of dry and liquid hauling requirements.

In addition, Fruehauf's nationwide chain of branches provides fast, efficient, competitively-priced service wherever your vehicles operate.

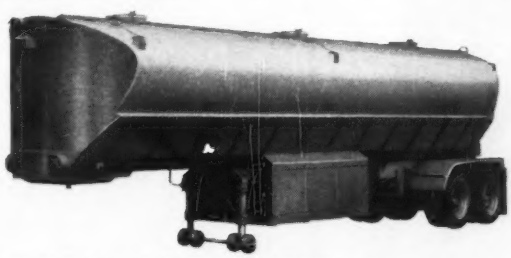
*Airslide—Trademark—Fuller Company



Clean Design Utility Steel Tank-Trailer
—for hauling crude oil, hot road oil, non-edible lard, tallows and fats, non-corrosive heavy chemicals and lubricating oils.



Steel Acid Tank-Trailer
—for specialized transportation of acids, liquid chemicals, acid and alkaline commodities.



Screw Type Aluminum Bulk Flour Tank-Trailer
—for hauling bulk flour, mixed feeds, and a multitude of non-corrosive bulk chemicals.

Aluminum Triple Panel Bulk Flour Tank-Trailer
—for sanitary, fast, efficient, low cost transport of bulk flour and non-corrosive bulk chemicals.

Airslide* Pneumatic Pressure Tank-Trailer
—for hauling soda ash, ground phosphate, silica flour, gypsum, vinyl chloride, calcium anhydrite and similar sensitive and hard-to-handle materials.

FRUEHAUF TRAILER COMPANY
10948 Harper Avenue • Detroit 32, Michigan

SEND FULL FACTS, WITHOUT OBLIGATION, ABOUT THE FOLLOWING

TYPES OF FRUEHAUF TANK-TRAILERS (1)_____

(2)_____ (3)_____

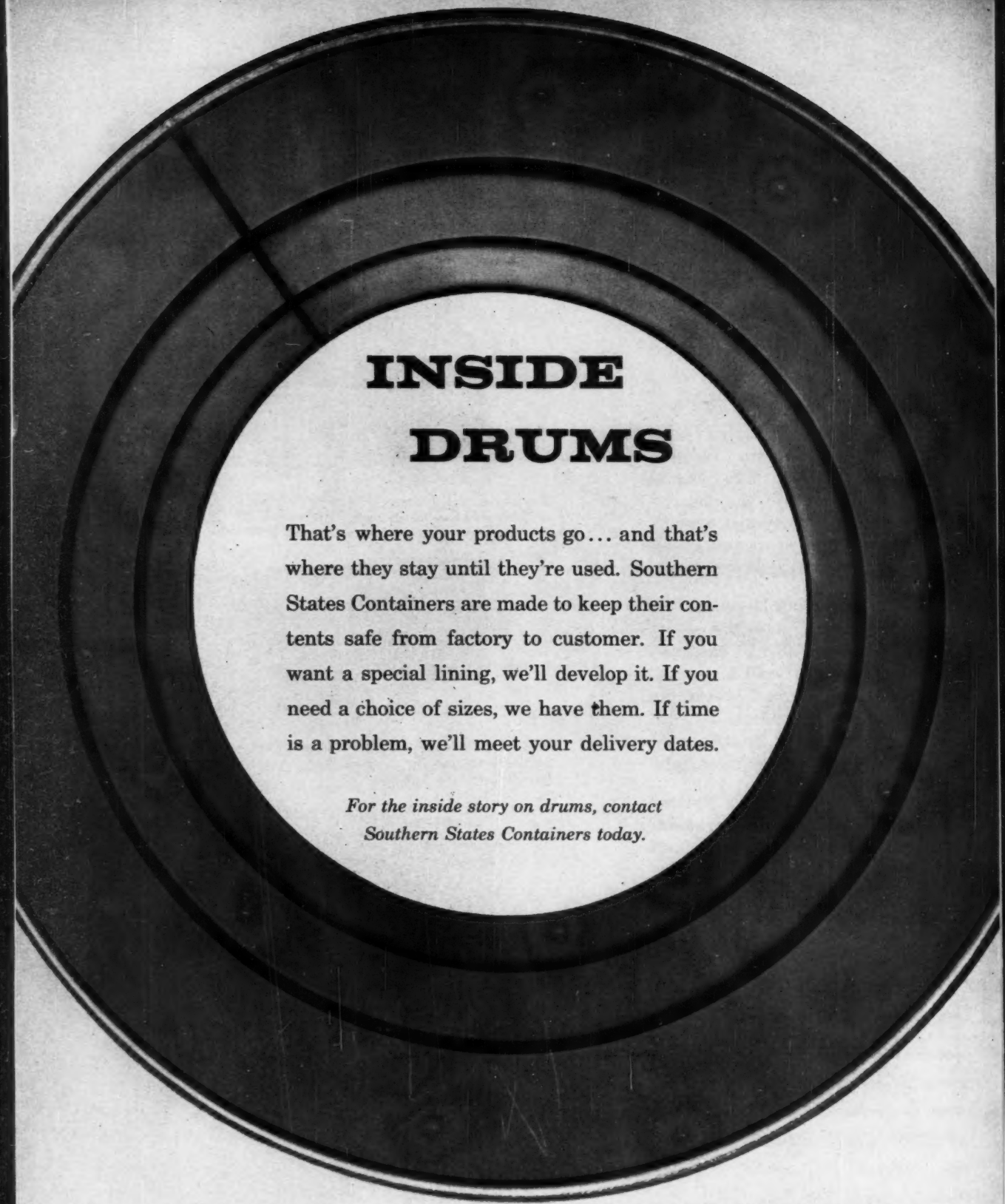
(4)_____ (5)_____

Name_____
(PLEASE PRINT)

Company_____

Address_____

City_____ State_____



INSIDE DRUMS

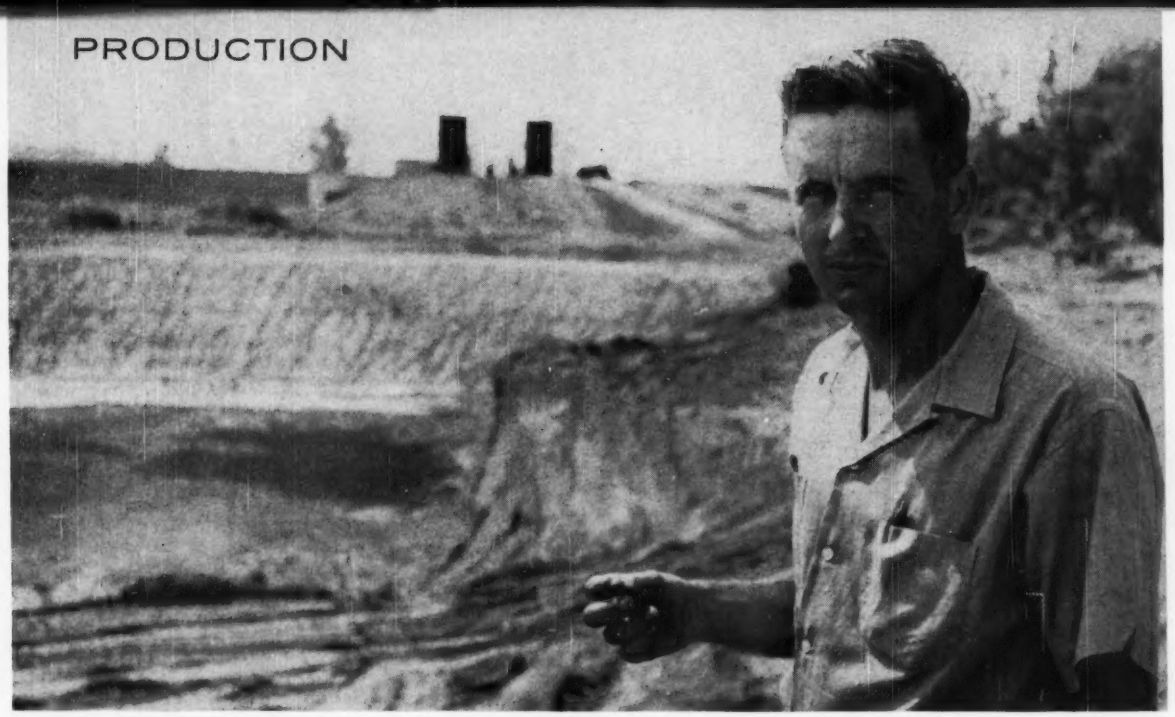
That's where your products go... and that's where they stay until they're used. Southern States Containers are made to keep their contents safe from factory to customer. If you want a special lining, we'll develop it. If you need a choice of sizes, we have them. If time is a problem, we'll meet your delivery dates.

For the inside story on drums, contact Southern States Containers today.

SOUTHERN STATES CONTAINERS

DIVISION OF REYNOLDS ALUMINUM SUPPLY COMPANY

2830 Fifth Avenue, North FAirfax 2-5461 Birmingham, Alabama



Conservation Chemical's Hjersted stands beside basin he is readying to receive plant waste liquors.

One-Man Plant Waste Disposal Service

This week, behind the levee that holds back the Missouri River from the Northeast Industrial District of Kansas City, Mo., Norman Hjersted, a chemical engineer and one-time farmer, is supervising the storage of metal pickling wastes in basins he has carved out of a six-acre plot with his farm tractor. Later, he expects to receive wastes from chemical and petroleum plants. And this winter he will be ready to start up facilities to treat the wastes.

Hjersted's activities mark the beginning of a new and unusual service for local plant management. His Conservation Chemical Co. will treat and dispose of wastes that industry has traditionally dumped into sewers, or, if necessary, treated itself.

His adaptation of a farm tractor to land bulldozing is typical of the resourceful, cost-cutting techniques he has had to use to get started. But if Hjersted's claims are borne out, that he can treat wastes more economically than industry can, he will have no lack of customers. And plant management in other areas are certain to see similar services spring up.

One company similar to Conservation Chemical is already operating in the Buffalo, N.Y., area. Frontier Chemical Process, Inc., started operations about five years ago as a seller of ferric chloride to municipal treatment facilities, added industrial waste disposal services about two and one-half years ago.

Chemical "junkmen" have been operating for many years (*CW, Jan. 19, '57, p. 66*). But they rely on selling recovered materials for their profits. Conservation and Frontier are set up to operate at a profit solely from the fees they charge for treating and disposing of wastes.

Some municipalities are operating facilities for treatment of industrial wastes, charging fees similar to those of Conservation and Frontier. But often the industrial load is too great, and a few companies are working on arrangements similar to American Cyanamid's at Bound Brook, N.J., where the plant helps to treat the local community's wastes (*CW, June 14, '58, p. 86*).

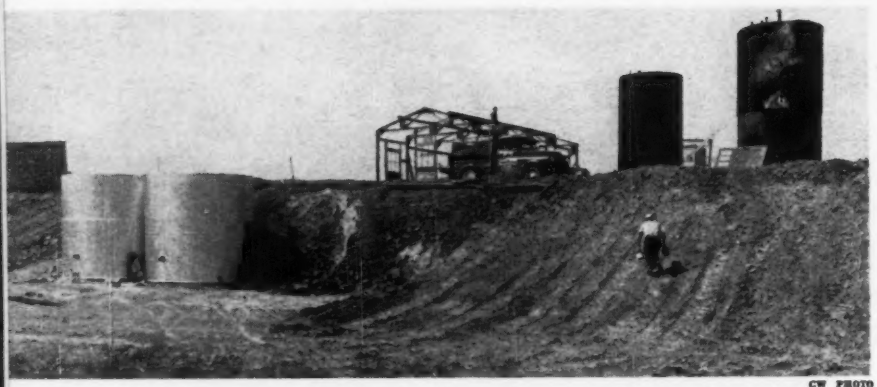
Alternate Plan: For plant management in the Kansas City area, Hjersted's new Conservation Chemical offers more than a potential cost-saving service. It is an alternate to building in-plant facilities to meet deadlines for industrial waste control set at a local conference called by the U.S. Public Health Service three years ago (*CW, Nov. 16, '57, p. 33*) to help smooth the pollution-troubled waters of the Missouri.

Hjersted, who was working at a local refinery at the time of the deadline-setting pollution conference, had been toying with the idea of Conservation Chemical for some time before the conference. Following the conference he went to work on the plan in earnest—first making certain that what he would do would be competitive with other waste disposal methods, and even cheaper.

The basis is sound for predicting that treatment costs of a service like Hjersted's will be lower than for a plant's own system. Hjersted will be able to blend wastes that plants may produce intermittently, come up with a uniform waste. Dow Chemical's Tom Powers, who is consulting director for waste treatment with the company's Industrial Service Division, points out that nonuniformity of wastes can be a major headache in many treatment plants (*CW, March 19, p. 47*).

By receiving many different types of wastes, Hjersted will be able to use some wastes to treat others. For example, he will use some acid wastes to treat others that are alkaline. And his higher volumes and specialization in the treatment field will also help to lower operating costs.

Firm charges haven't yet been worked out. Much will depend on



CW PHOTO

Hjersted runs up embankment with supplies. He's doing much of design and construction himself, saving on equipment by buying second-hand when possible.

the nature of the wastes, quantities, etc. But roughly, Conservation Chemical will probably charge about 1¢/lb. for acids (a rule of thumb for acid disposal is that disposal costs about as much as the purchase price). For hexavalent chromium wastes, the charge will be about 20¢/lb. (at least one municipal disposal service charges 45¢/lb.). Pickle-liquor charges will be about $6/ton; phenolic wastes about $1/lb. For treating cyanide wastes, Hjersted says, the charges will be well under the prevailing industry disposal cost of about $2/lb.

Field Surveys: Hjersted's initial project was a literature search on waste treatment, which he completed in the spring of '58. He followed that with inquiries to more than 100 potential customers. Then a market study showed that he could lower his operating costs by selling ferrous sulfate recovered from pickle liquor. He spotted a number of other potential recovery products (e.g., sodium sulfate, sulfuric acid). But with the exception of ferrous sulfate, he has developed no immediate recovery plans.

Later he worked up a questionnaire on waste availability, used it in plant-to-plant canvassing to get a clearer picture of the size of plant he would need and where it should be located. He purchased land adjoining Kansas City Power and Light's Hawthorne Power Station. From this spot he can run a 5-to-8-mile pipeline that could hook up with as many as 12 potential customers. Hauling charges for wastes that can't be pipelined will probably be 1¢ to 5¢/gal. Cheapest rate will be for barged-in wastes. Hjersted hopes to be able to barge wastes from St. Louis and other downstream points at about 1¢/gal. because barge lines have little upstream traffic.

Advise with Consent: Although Hjersted has been doing most of the work — including land preparation and equipment erection—Conservation Chemical is not a one-man operation. Hjersted has assembled a staff of advisors and part-time helpers —with the consent of their employers in 19 out of 20 cases. Where charges for services have been small, he has paid in cash; but often he has paid in shares of Conservation stock.

James Adams of the nearby Chemagro plant, a biochemist, will be the firm's consultant on tricky biological degradation of wastes. Albert Saeger of Kansas City University will help in the field of bacteriology. And Robert Garrett of Transworld Airlines will help with problems in plating-industry wastes. James Afflick of Battenfield Oil and Grease, who was once a supervisor at the Kansas City water works, will consult on water problems (i.e., which wastes can be safely released to the Missouri River, which ones will require further treatment).

Hjersted has also received help in plant design. And he knows how to spot an equipment bargain when he sees one. For example, he purchased an almost-new $8,000 rotary compressor for $100 from one local firm.

Hjersted still owns two small farms, which he now rents. The prospects for Conservation Chemical make it doubtful he will return to farming.

EQUIPMENT

Epoxy Pipe Joint: Tex-Tube, Inc. (Houston) has developed a new low-cost method of joining steel pipe with an epoxy adhesive. The technique will be used with its new Series 500 bell-joint pipe. The epoxy adhesive is applied to the mating pipe ends, which are then held together with a special crimping tool until the adhesive sets. The joint reaches maximum strength in 48 hours, can be used with 1½-to 3½-in. pipe at 1,200-psi. working pressure and with 3½-to 6⅝-in. pipe at 800-psi. working pressure. The company says the technique can reduce installation costs 25% and installation time 50%.

•

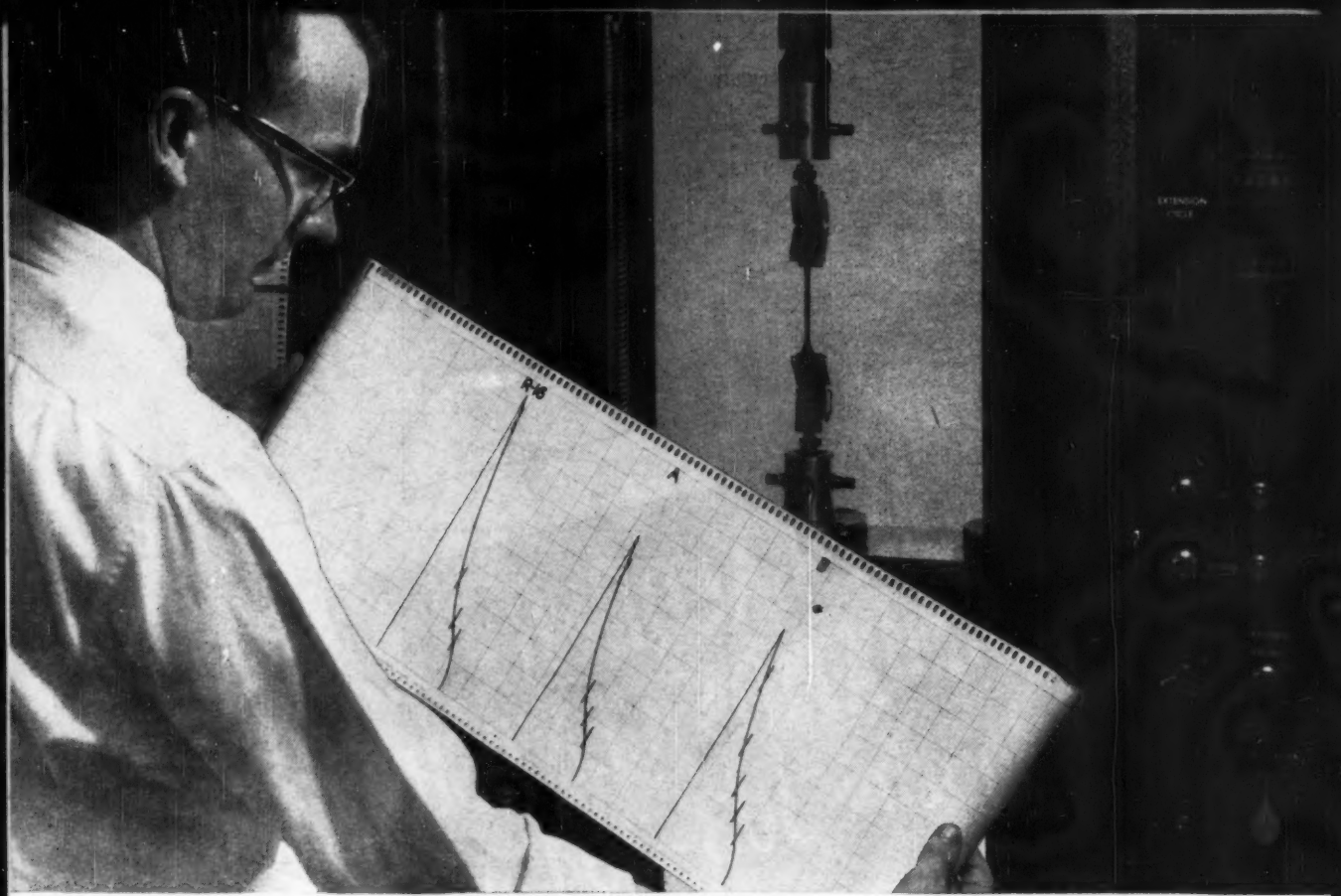
Expansion Joints: Bellows-type expansion joints are now being made of titanium by Tube Turns Division of Chemetron Corp. (244 East Broadway, Louisville 1, Ky.). The first application was in a steam line, where chlorides had limited the life of stainless-steel bellows to 30 days.

•

Paper Weighing: PolyTech Research Inc. (25 North Texas St., Orlando, Fla.) is out with a new electronic gauge for measuring the basis weight of paper on the production line at paper mills. The company says the gauge is not affected by moisture, will measure the weight accurately when the paper is soaking-wet or bone-dry because it operates in the infrared region at about 7,500 angstroms. Detector heads of the gauge are located at 1-ft. intervals across the width of the paper sheet, are connected to two strip-chart recorders (one for basis weight, the other for moisture content).

•

Insulation Sealer: Glidden Co. (Cleveland) says its new insulation sealer will reduce the protection cost for all commonly used types of insulation by as much as 70%. Called Insulcap, the sealer acts as a condensation barrier for insulation on ducts, pipelines, furnaces and other equipment exposed to moisture and temperature variations. The sealer is applied in two coats, dries to the touch in 20 minutes at 70 F, may be recoated in four hours. Applications can be made with brush, spray gun, roller or mitten. The sealer resists water vapor, acids and alkalis.



Dr. Stanley Jankowski, one of Neville's senior chemists, is shown here holding a test chart showing the results of tensile testing three aged rubber samples. The chart is just as it came from the Instron Tester, except that scribe lines have been inked over and labeled for visability in the picture. They have not been changed. From left to right, samples contained Neville's R-16 Coumarone-Indene Resin, competitive resin A and competitive resin B. Detailed results are shown below.

Competitive tensile test shows Neville Resin superior

Neville's R-16 Coumarone-Indene Resin was matched against two other leading resins in a neutral colored SBR test recipe compounded for comparative analysis. The results were as follows:

	Average Tensile	Aged Average Tensile	% Tensile Retention
Neville's R-16	1830 psi	1400 psi	76.5
Competitor A	1680 psi	1150 psi	68.5
Competitor B	1655 psi	1275 psi	77.2

Beyond superior tensile strength, there are other benefits derived from compounding rubber with R-16 Neville Resin. Elongation, both before and after aging, is exceptional and considerable aid to processing is enjoyed. Better mold flow and easier dispersion of fillers are also realized in using R-16 Neville Resin. Use the coupon to write for further information.

Resins—Coumarone-Indene, Heat Reactive, Phenol Modified Coumarone-Indene, Petroleum, Styrenated, Alkylated Phenol • **Oils**—Shingle Stain, Neutral, Plasticizing, Rubber Reclaiming • **Solvents**—2-50-W Hi-Flash*, Wire Enamel Thinners, Nevsolv* • **High Purity Indene.**

* Trademark

Neville Chemical Company, Pittsburgh 25, Pa.

NEVILLE®

☐ Please send information on Neville Coumarone-Indene Resins.

NAME TITLE

COMPANY

ADDRESS

CITY STATE

Here's your ticket to visit us during the Paint Show

NEW LACQUER INFORMATION CENTER Booths 303-304

MODERN COATINGS EXHIBIT Booths 214-215

Sherman Hotel, Chicago
Oct. 29—Nov. 2

HERCULES POWDER COMPANY
INCORPORATED
Hercules Tower, 910 Market Street, Wilmington 99, Delaware

CL60-7

Market Newsletter

CHEMICAL WEEK
October 22, 1960

Vinyl chloride prices got a new, lower look last week. Solvay Division of Allied Chemical initiated the price drop by posting new vinyl chloride tabs of 11.3¢/lb., f. o. b. Perkins, W. Va. (Moundsville, W. Va.). This new price allows freight, thus making the 11.3¢/lb. quote a "delivered" price.

Monsanto reports it will meet the new quotes, allowing freight, but shipping f. o. b. Texas City, Tex. Most other companies contacted were still studying the situation. It's probable, however, that the new tabs will become industry-wide prices.

•

More European phthalic anhydride capacity is coming onstream. In England, South Western Tar Distilleries Ltd. has started up its 7-million-lbs./year plant at Totton, using St. Gobain's new orthoxylene process, and St. Gobain is doubling capacity of its own plant at Chauny, France, and switching over to the new process.

•

A cartel of Japanese chemical fertilizer manufacturers in the offing? Producers in Japan are showing mounting interest in an international organization to control export of ammonium sulfate. Under pressure from European manufacturers, Japan has been forced to export its product at a price below breakeven costs so as to maintain some of the overseas markets. Result: Ammonium Sulphate Exporting Co. (an exports collection agency for Japan's chemical manufacturers) has sustained losses estimated at $32 million.

According to one source, the solution of the problem may be to reduce ammonium sulfate output gradually. (Its place in fertilizing could be taken by urea.) One company, Asahi Chemical, has already stopped making the sulfate.

Almost half of Japan's output of ammonium sulfate during the first six months of '50 was exported—600,969 tons out of a total production of 1.4 million tons left the country.

•

World consumption of natural and synthetic rubber totaled 2.19 million tons during the first seven months of '50, according to estimates of the Business & Defense Services Administration's Secretariat of the International Rubber Study Group. This was 3.5% higher than the 2.1 million tons turned out during the same period of '59. Biggest gains came from foreign countries (excluding Russia and Red China), whose consumption increased 11%, from 970,986 to 1.08 million tons. U. S. consumption was up only 0.7%, to 944,251 tons.

Synthetic rubber continues to make the biggest gains. Excluding production and consumption of Iron Curtain countries, world synthetic rubber output increased 22% during the first seven months of this year,

totaled 1.12 million tons, vs. 880,000 in the same period of '59. Consumption: 1.02 million tons vs. 893,000 tons.

Natural rubber consumption slipped slightly during '60's first seven months, to 1.17 million tons from 1.2 million in the first seven months of '59. Imports into Russia and Red China were also off, totaled 168,000 tons during the first seven months, a drop of 39,000 compared with the same period of '59.

German rubber consumption is expected to reach 256,000 tons this year, of which 41% will be synthetic and 59% will be natural. Output during first-half '60 increased to 108,880 tons, up almost 19% from the 91,698 tons produced in the first six months of '59.

As on the world scene, synthetic rubber continues to make the biggest strides in German industry. Of the total output, synthetic accounted for 45,670 tons, an increase of 55.9%. Meanwhile, natural rubber was up only 1.3%, totaled 63,210 tons. Last year the ratio of synthetic to natural was 34/66.

•

A form of stannous fluoride for application by dentists will be available soon, Metal & Thermit Corp. told members of the American Dental Assn., meeting this week in Los Angeles. M & T will sell the product in 1-gram units for individual topical applications by dentists. Distribution will be through regular dental supply channels. Use of stannous fluoride as a decay controller was first proved out in Crest toothpaste, a fluoride-containing dentifrice developed by Indiana University and Procter & Gamble (*CW, Aug. 20, p. 92*).

•

Acid-grade fluorspar concentrates have begun to roll across the Rio Grande River into west Texas from Dow's La Domincia fluorspar mill in Mexico. Destination is the company's recently completed terminal near Marathon. The mine is located in the Pico Etereo area of Coahuila, about 25 miles southeast of the mill.

Big question now: Where will the material be consumed? Du Pont is often mentioned as the most likely taker since the company is a big producer of fluorocarbons for which fluorspar is an important raw material. Dow's own needs in its magnesium process are moderate at this time.

SELECTED PRICE CHANGES—WEEK ENDING OCTOBER 17, 1960

	Change	New Price
UP		
Coconut oil, crude, tanks	$0.0025	$0.14
Tin metal, Straits	0.01	1.04
DOWN		
Capric acid, tanks	$0.015	$0.2675
Caprylic acid, tanks	0.015	0.2675
Lauric acid, tanks	0.015	0.2975
Myristic acid, tanks	0.015	0.2425

All prices per pound unless quantity is quoted.

FOR UP-TO-DATE CLEANING EFFICIENCY...

ADD PFIZER GLUCONATES TO YOUR CAUSTIC FORMULATIONS

It's true! Caustic cleaning solutions for the following jobs are more effective with Pfizer Gluconates:

BOTTLE WASHING—The inclusion of Pfizer Gluconates in your formula gives your bottling customer a washing compound that gets bottles sparkling clean—free of haze and rust spots that could mar their appearance. Pfizer Gluconates also provide for more efficient aluminum label removal and prevent the development of scale on equipment.

RUST REMOVAL—Outstanding caustic rust removal compounds are possible with Pfizer Gluconates. Besides dissolving rust efficiently, the presence of gluconates will retard after-rust and prolong the life of the bath. Also, a small amount of gluconate added to standard alkaline cleaning compounds helps in the removal of light rust films.

ALUMINUM ETCHING—Pfizer Gluconates in aluminum etching compounds prevent the formation of hard, adherent scale. Efficient and economical, too, because you use very little gluconate in the compounds, yet assure an even, uniform etch.

STRIPPING PAINT FROM STEEL—Pfizer Gluconates improve the efficiency of caustic paint-stripping compounds. They increase the rate of paint film removal and permit free rinsing of the paint-stripped metal. Pfizer Gluconates eliminate the usual after-film of iron oxide.

Pfizer Gluconates have a proven record of stability in caustic compounds, both in storage and in use. Be sure your caustic formulation line is complete. Write to Pfizer for technical data and use-level information on sodium gluconate and gluconic acid.

Please send me Technical Bulletin 102, "Pfizer Products for Chemical Cleaning."

NAME_____

TITLE_____

COMPANY_____

ADDRESS_____

CITY_____ STATE_____

CW

CHAS. PFIZER & CO., INC.,
CHEMICAL SALES DIV.,
630 FLUSHING AVENUE,
BROOKLYN 6, NEW YORK

Science for the world's well-being
Manufacturing Chemists for Over 100 Years

Pfizer

Branch Offices: Clifton, N. J.; Chicago, Ill.; San Francisco, Calif.; Vernon, Calif.; Atlanta, Ga.; Dallas, Texas; Montreal, Canada

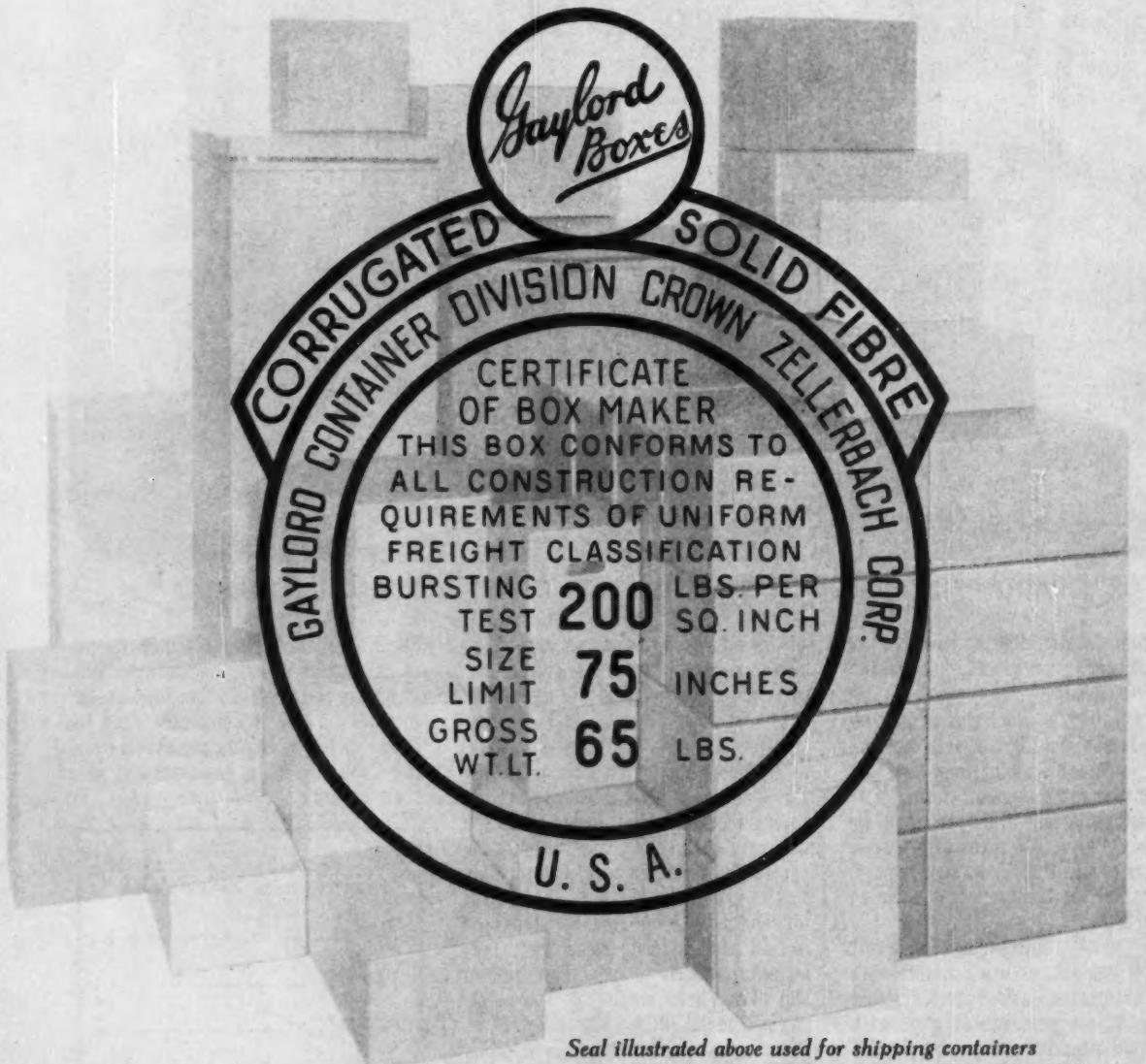
This is only one proof of GAYLORD *quality*

Here you read the measurable qualities in Gaylord Containers.

But how do you measure experience and ingenuity . . . which are *extra* qualities built into every Gaylord box?

Gaylord is part of a completely-integrated, nation-wide organization of packaging talents, devoted to delivering the most efficient, most economical container you can buy.

Your nearby Gaylord Man can prove this. Why not let him try?

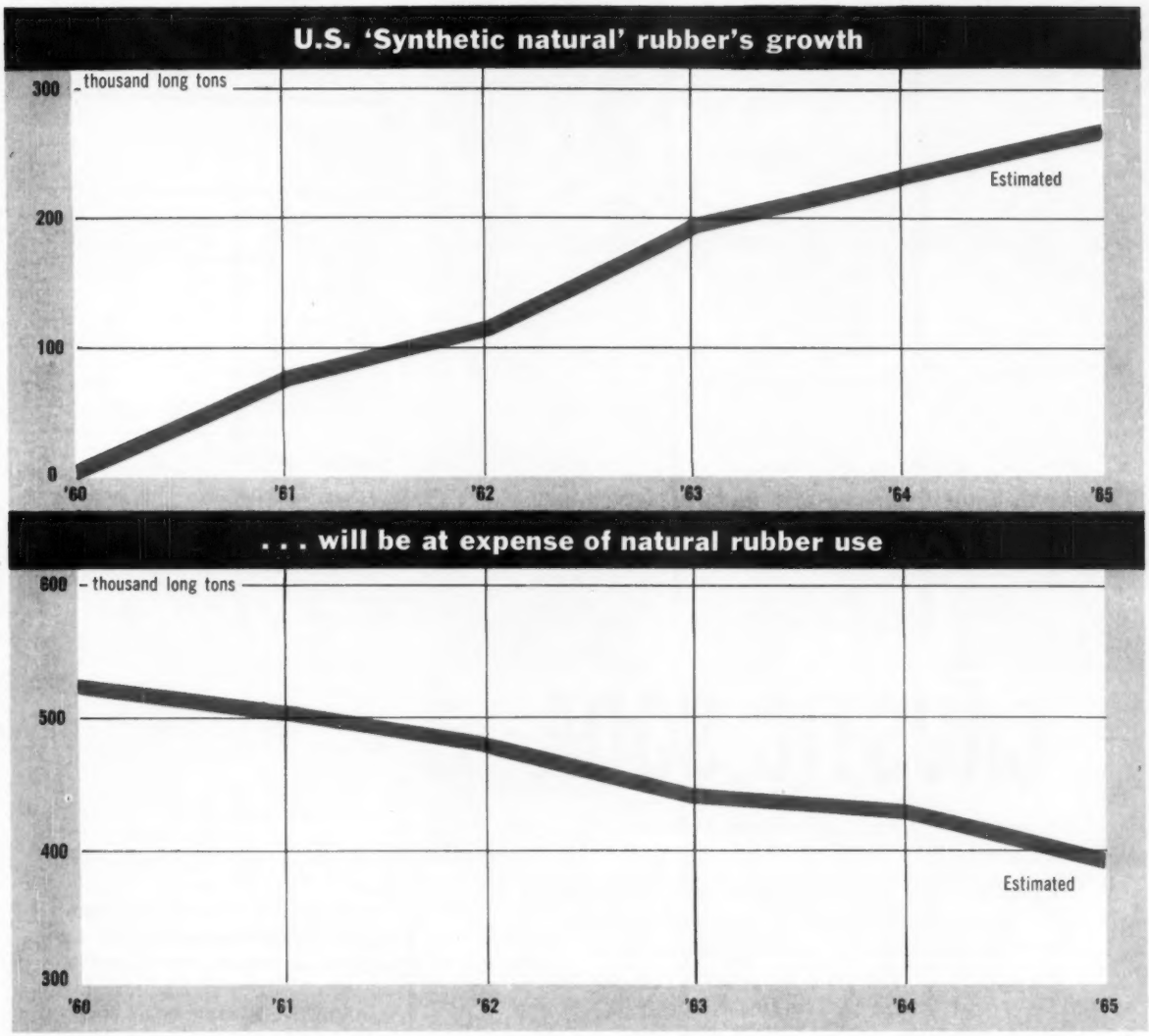


Seal illustrated above used for shipping containers conforming to Uniform Freight Classification No. 41.

CROWN ZELLERBACH CORPORATION
GAYLORD CONTAINER DIVISION

IN CANADA · CROWN ZELLERBACH CANADA, LTD. VANCOUVER, B.C.

HEADQUARTERS, ST. LOUIS
PLANTS COAST TO COAST



New Synthetics Ready for Rubber Markets

This week the first commercial-size 40-million-lbs./year "synthetic natural" rubber plant in the U.S. was brought onstream by Shell Chemical at Torrance Calif., marking the beginning of a tidal wave of new capacity. Later this year and next year several other synthetic-natural plants will be about ready to run. Among them:

• Phillips' new, 25,000-long tons/-year plant at Borger, Tex. The *cis*-polybutadiene unit will begin producing within the next several weeks, with commercial shipments slated to start in January.

• Firestone Rubber's 30,000-tons/-year polybutadiene plant at Orange, Tex., will go onstream in early '61.

• Goodyear Tire, which has been running a $750,000 synthetic-natural rubber pilot plant since late '57 (*CW, Butylenes Special Report, May 28*), is putting up polyisoprene and polybutadiene installations to be completed in mid-'61 (estimated capacity: 40,000 to 15/year).

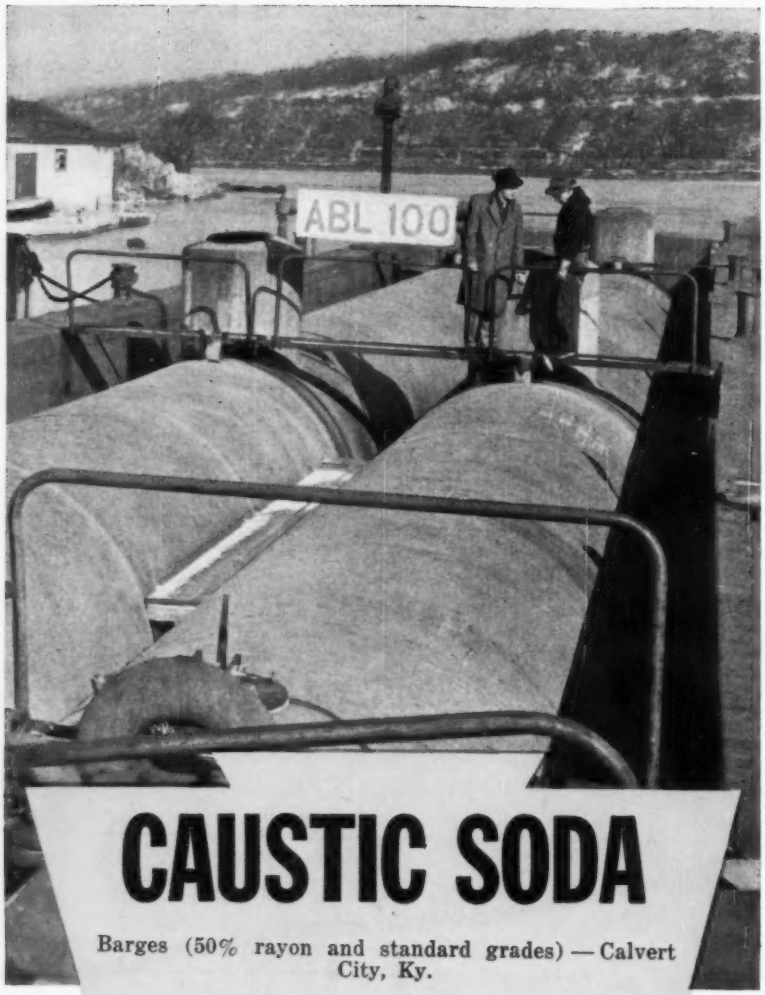
• American Rubber & Chemical is planning a late-'61 startup of 30,000-tons/year polyisoprene and polybutadiene plant at Louisville, Ky.

• Also in late '61 Shell expects to be operating an 80-million-lbs./year integrated monomer-polymer plant in Ohio.

In early '62 Goodrich-Gulf is expected to get a 25,000-tons/year plant onstream. Location will be either Institute, W.Va., or Orange, Tex.—more likely the latter site. Texas-U.S. Chemical will also complete a 30,000-tons/year synthetic-natural rubber facility in '62, although a plant site has not been decided.

And these are not all the upcoming expansions.

U.S. Rubber just a couple of weeks ago revealed that it would construct a



CAUSTIC SODA

Barges (50% rayon and standard grades) — Calvert City, Ky.

Tank Cars (50%, 73% rayon grade)—Calvert City, Ky.

Tank Cars (50% and 73% standard grade)—Calvert City, Ky. and Wyandotte, Mich.

Tank Cars (50% standard grade)—Lemont, Ill. and McKees Rocks, Pa.

Tank Trucks (50% standard grade)—Calvert City, Ky., Wyandotte, Mich., McKees Rocks, Pa., Lemont, Ill.

Drums (solid, crystal and flake)—Wyandotte, Mich.

Pennsalt Field Men can give you valuable help in the handling, storing and application of caustic soda. Industrial Chemicals Division, PENNSALT CHEMICALS CORPORATION, Three Penn Center, Philadelphia 2, Pa.

Industrial Chemicals Division

SALES OFFICES: CHICAGO • DETROIT • NEW YORK • PHILADELPHIA PITTSBURGH • ST. LOUIS • APPLETON • ATLANTA TACOMA • PORTLAND

INDUSTRIAL QUÍMICA PENNSALT, MEXICO CITY

Pennsalt Chemicals ESTABLISHED 1850

PENNSALT CAUSTIC SODA is made at Calvert City, Ky.; Portland, Ore.; Tacoma, Wash.; Wyandotte, Mich.; and Mexico City

'Synthetic Natural' Rubber Production Capacity

thousand long tons

	'60	'61	'62
Shell Chemical			
Torrance, Calif.	20	—	—
Marietta, O.	—	40	—
Phillips Petroleum			
Borger, Tex.	25	—	—
Firestone Tire & Rubber			
Orange, Tex.	—	30	—
American Rubber & Chemical			
Louisville, Ky.	—	30	—
Goodyear Tire & Rubber			
Beaumont, Tex.	—	40	—
Goodrich-Gulf	—	—	25
Texas-U.S. Chemical	—	—	30
Total new capacity	45	140	55
Total in place		185	240

$2-million pilot plant in Baton Rouge, La., "for trial production of a new class of synthetic stereoregular rubbers."

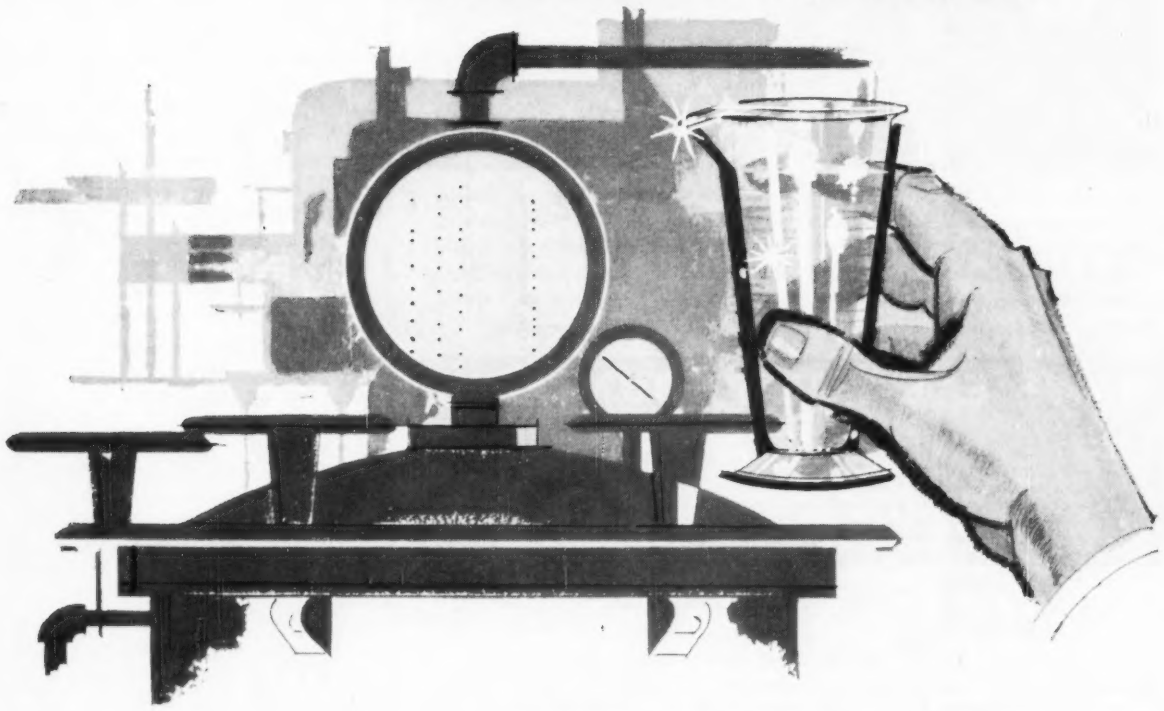
Pushing toward eventual commercialization are Montecatini, and General Tire & Rubber, among numerous others.

All told, U.S. capacity for the new rubbers will have passed the 200,000-tons/year mark by early '62. Big question rattling around the industry: Where is it all going?

The price tag put on these materials by the potential producers—30-35¢/-lb.—makes it clear that, initially at least, the so-called synthetic naturals will slash away at natural rubber markets. Price of the natural material is now 35¢/lb. (f.o.b. New York), while SBR is 23¢/lb. and the oil-extended SBR, 19¢/lb.

Although referred to by many names, the synthetic-natural rubbers are two specific synthetic elastomers: *cis*-1,4,polyisoprene and *cis*-1,4,polybutadiene. The former is a duplicate of the natural product and presumably can be substituted for it in all of its uses. The latter, although different

New Standards of Filtration Control



made possible by **EAGLE-PICHER** *filter aids!*

here's why:

Eagle-Picher's vast Nevada operations have made newly available *several million tons* of extremely high quality filter aid diatomite.

Exact grades are pin-pointed by "Strato-Test" field classification. Exceptional purity is ensured from the start.

A complete range of grades of filter aids are produced by Eagle-Picher in the world's newest, most efficient diatomite processing plant.

With this remarkable "on-grade" uniformity, you get precise control of clarity, at controlled flow rates.

Non-organic, Eagle-Picher filter aids are sterilized . . . are chemically and physically inert. Cannot alter or impart flavor.

You get "sharp" filtration that removes all thermophiles and unwanted solids in the colloidal and submicroscopic range.

The unmatched purity of Eagle-Picher Filter Aids results in a lower wet density, providing greater surface coverage. Users report substantial production economies.

Testing Samples, Consultant Services— yours for the asking. Write, wire or call us at any time.

EAGLE EP PICHER

Since 1843

EAGLE-PICHER

The Eagle-Picher Company
Cincinnati 1, Ohio

Mail Coupon for complete technical data and sample
The Eagle-Picher Co., Dept CW-1022, Cincinnati 1, Ohio

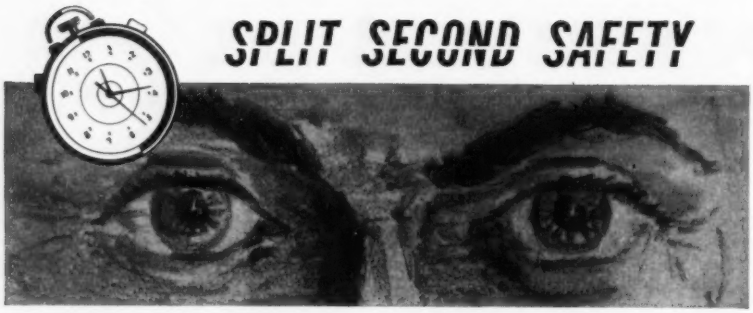
☐ Please send additional information
☐ Please submit sample_____ (size needed)
Type Product to be filtered

Filter-Aid to be used for:
☐ Primary filtering ☐ Pre-coat
☐ High clarity or polishing ☐ Admixture

NAME_____TITLE_____

COMPANY_____

STREET_____CITY_____STATE_____

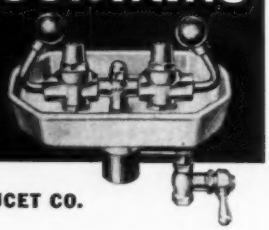


IN EMERGENCY... contaminated eyes are instantly cleansed of dangerous particles and chemicals by *controlled* water streams from HAWS Emergency Eye-Wash Fountains. This "split second safety" before medical aid arrives can mean the difference between temporary eye irritation and permanent eye injury! HAWS will provide emergency facilities best suited for your safety program—minimizing hazards, reducing claims, lowering insurance costs. Get the facts by writing today for illustrated literature!

HAWS EYE-WASH FOUNTAINS

MODEL 7100
(old model 8930)

Basic eye-wash model with enameled iron bowl; quick-opening valve for manual operation; adaptable to treadle operation; chrome plated brass water pressure regulators and twin fountain heads. Wall mounted and pedestal models available.



HAWS 50 YEARS 1909 1959

HAWS DRINKING FAUCET CO.
Since 1909
1443 FOURTH STREET
BERKELEY 10, CALIFORNIA

EXPORT DEPARTMENT: 19 Columbus Avenue, San Francisco 11, California, U.S.A.

A LEADER IN BIOCHEMICAL RESEARCH

attention:

PRODUCT DEVELOPMENT DIRECTOR √
PURCHASING DIRECTOR √
RESEARCH DIRECTOR √
SALES DIRECTOR √

offers over 60 regular items
to the pharmaceutical...cosmetic...dairy ...and chemical industries...including—

ENZYMES • ANTIOXIDANTS • HORMONES
FINE CHEMICALS • GLANDULARS

plus 20 items for experimental purposes,
such as—ANIMAL BLOOD FRACTIONS, ORGANIC CHEMICALS, BIOCHEMICALS, INCLUDING SPECIAL ENZYMES

For more information, contact our technical representatives. Call WElls 2-6771 in Kankakee, Illinois. Or write to:

Bio-Chemical Dept.
ARMOUR PHARMACEUTICAL COMPANY
Kankakee, Illinois

in chemical structure, displays somewhat similar but improved physical properties when compared with natural rubber. But it's also somewhat harder to process.

Since the new materials have these price and properties advantages, consensus is that they will have no difficulty in carving out a big share of the total U.S. rubber market .

By the end of this year not more than 5,000 tons of the new rubbers will be used in this country. But within five years consumption will be about 275,000 tons/year.

All of this market would have gone to natural rubber if the synthetic naturals had not appeared on the scene and barring exceptional price increases.

The price of natural rubber has vacillated considerably in the past years because it is a commodity of the open market whose price is controlled by world supply and demand. For example, it was 26¢/lb. in '53, 48¢ in '55 during the boom of U.S. auto production, slipped back to 26¢ in recession year '58, and rose again in '59 when business conditions picked up.

The U.S. has historically been consuming approximately 25% of the total world supply of natural rubber. Consequently, the varying needs of the product in this country has played an important part in the world supply-and-demand balance and market price.

But economists weighing the advent of synthetic-natural rubber and decreasing needs for the natural product in this country have concluded that the growth of the U.S. synthetic-natural rubber industry will not depress the world price of the natural product. It will instead, they say, prevent escalated prices.

During '59, industry faced the most acute shortage of natural rubber in 50 years, according to G. F. McIvor, chairman of the Rubber Trade Assn. of London. The world demand for natural rubber seems to be growing more rapidly than the world supply. Arrival of the synthetic naturals is therefore a timely occurrence for the U.S. production economy — preventing any future shortages. For example, by '65 the estimated world supply or capacity will have reached 2.2 million tons. The world demand will be approximately 2.06 million tons—

How specifying AMOCO Oxo Alcohol results in better quality phthalate plasticizers

If you make DDP, DDA, DIOA and DIOP you can produce lighter colored, more stable plasticizers with AMOCO Oxo Alcohol. The extremely low carbonyl content, excellent esterification color and storage stability of AMOCO Oxo Alcohols are the reasons. The mechanical and electrical properties of vinyls compounded with DDP made from AMOCO Decyl Alcohol are particularly outstanding.

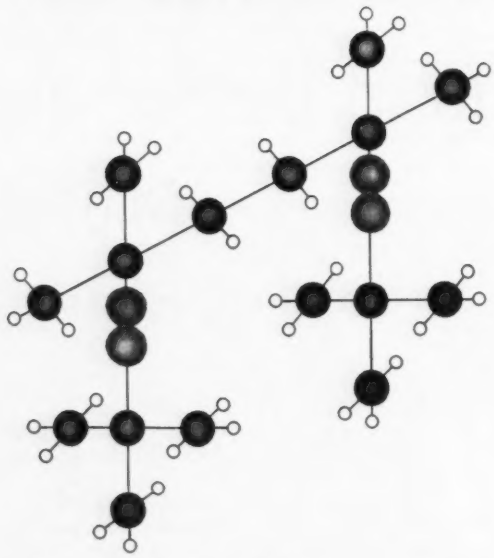
As an esterifier you get an important plus with AMOCO Oxo Alcohols in addition to better quality finished product. You get improved processing. Crude esters require less bleaching to meet color specifications. Less trouble is encountered with the re-use of unreacted alcohol.

Your inquiry about AMOCO Oxo Alcohol will receive immediate attention.

AMOCO CHEMICALS

AMOCO CHEMICALS CORPORATION
910 South Michigan Avenue
Chicago 80, Illinois

LUPERSOL 101



2,5-dimethyl-2,5-di (t-butylperoxy) hexane

LUPERSOL® 101 is a stable, liquid, high temperature difunctional peroxy compound with low volatility and high purity. It offers advantages of economy and performance in:

1. Polyethylene Cross-linking. Processing at high temperature (up to 270°F) with normal techniques. No noxious by-products.
2. Styrene Polymerization. Higher molecular weights. Broader molecular weight distribution. Use **5 to 10 times less** than conventional catalysts.
3. Polyester Resins. Obtain longer shelf life. Use higher processing temperatures. Use **4 times less** than conventional catalysts.

Half-Life in Benzene

240°F	16.7 hrs.
266°F	2.8 hrs.
300°F	0.26 hrs.

Properties

Active Oxygen	10.5% min.
Boiling Point	50-52°C @ 0.1 mm. Hg.
Vapor Pressure	65°C @ 0.71 mm. Hg.
	50°C @ 0.39 mm. Hg.

Write for Data Sheet

LUCIDOL DIVISION

WALLACE & TIERNAN INCORPORATED
1740 MILITARY ROAD
BUFFALO 5, NEW YORK

1.66 million tons foreign and 0.4 million tons domestic.

Uses for the Synthetic Naturals: Potential producers of the sterospecifics, or synthetic naturals, are initially aiming their sights at the biggest natural rubber market: large tires. In '60 an estimated 520,000 tons of natural rubber will be consumed in the U.S.; 220,000 tons will go into truck tires, 120,000 tons into other tires (bus, off-the-road equipment, etc.), and the remaining 180,000 tons will be used in a raft of miscellaneous products.

SBR, even at a lower price, has not been able to seriously challenge natural rubber's position in these markets—it does not meet the performance reqüirements. For example, truck tires, which constitute the single largest use of natural rubber, generate a considerable amount of heat in normal operation. SBR does not adequately dissipate this heat.

On the other hand, truck tires made with 50% natural rubber and 50% polybutadiene have proved superior to natural rubber tires in dissipating heat. In addition abrasion resistance has been improved.

The synthetic polyisoprene, also thoroughly tested in the laboratory and on the road, was equal and in some cases superior to natural rubber.

Producers: A review of current plant construction indicates that U.S. companies are quick to respond to the opportunities the synthetic materials offer. By the end of this year U.S. capacity will total 45,000 tons. By the end of '61 total capacity will have passed the 180,000-tons mark and at least 240,000 tons will be onstream by first-half '62.

Eight companies are involved. Six have captive requirements. It's a good bet that two of them, Shell and Phillips, have long-term contracts in hand for most if not all of their plant capacities.

Production facilities for *cis*-1,4, polyisoprene and *cis*-1,4,polybutadiene are almost identical. Equipment variations of the two processes are merely different requirements for blend tanks, catalyst preparation areas, solvent recovery systems, etc. The plants being constructed, therefore, can be considered capable of producing either of these elastomers—with only minor modifications.

ADVERTISEMENT—*This entire page is a paid advertisement* *Prepared by U. S. Industrial Chemicals Co.*

U.S.I. CHEMICAL NEWS

October 22 ★ A Series for Chemists and Executives of the Solvents and Chemical Consuming Industries ★ 1960

National Distillers Joins Shell International in Polyolefin Venture Abroad

A joint company has been formed by Shell International Chemical Company Ltd., London, and U.S.I.'s parent company, National Distillers, to develop plans for production and marketing of polyolefin film and packaging materials outside the U.S. and Canada. The new company operates from London.

National Distillers is one of the world's largest producers of polyethylene and owns the Kordite Company—a leading manufacturer in the U.S. of plastic film and packaging. It has recently set up a company in Switzerland to cover sales and development of polyethylene.

New Direct Halogenation Process Converts Impure Metal to Purified Halide

A safe and commercially adaptable process for the direct halogenation of crude metals—to obtain the corresponding halide substantially free of certain undesirable metal impurities—is covered in a patent recently issued to U.S.I.'s parent company, National Distillers. Metal halides which can be prepared by this process are those of the reactive metals such as titanium, zirconium, hafnium, columbium and tantalum.

As described in the patent, an impure feed such as scrap zirconium is safely reacted with a halogen gas by diluting the latter with an explosion-preventing proportion of helium, argon or neon. The reaction is carried out at 450°-900°C until 50-90% of the feed has been reacted. A metal halide is recovered which is considerably lower in metal impurity content than the original scrap feed. A typical analysis of $ZrCl_4$ prepared by this process is given in the following table:

COMPARATIVE METAL IMPURITY CONTENTS—METAL FEED VERSUS HALIDE PRODUCT

Metal Impurity	Low Hafnium Zirconium Scrap Feed*	$ZrCl_4$ Product*
Al	65	94
Cd	<0.5	0.8
Cr	700	35
Fe	970	140
Mn	23	< 5
Ni	255	<15
Pb	85	20
Sn	1.6%	188
Ti	< 20	<20
U	< 10	<10
W	< 20	<20

* Values in ppm based on zirconium unless otherwise stated.

Ammonia Production, Storage Capacity Expanded by U.S.I.

Refrigerated, Non-Pressurized Storage Tank to be Installed

Ammonia production capacity has been increased by 17%, and anhydrous ammonia storage capacity will soon be expanded by U.S.I. at its Tuscola, Illinois, plant. The plant is already operating at the expanded rate of 70,000 tons per year (up from 60,000 tons) and a new 6,000-ton storage facility is expected to be in full service by the end of the year.

This increased production and storage capacity are needed to assure rapid delivery to U.S.I.'s ammonia, aqua ammonia and nitrogen solutions customers, especially during the heavy seasonal demand in early spring. Because of the plant's location in Central Illinois, heart of the Midwestern fertilizer industry, most of its output is used as a raw material in this highly seasonal business. Other applications for U.S.I. ammonia include chemical processing, refrigeration and miscellaneous industrial uses.

Storage Tank Uses New Principle

The new 6,000-ton storage tank will use the relatively new principle of storing refrigerated ammonia at atmospheric pressure, rather than storing in pressurized tanks at moderate temperatures. The storage vessel consists of an inner tank, 88 feet in diameter and 56 feet high, separated from an outer tank by 2½ feet of insulation. Liquid ammonia is stored in the tank at a temperature of about −28°F. and this low temperature is maintained by evaporation of ammonia from the surface.

The evaporated ammonia is recompressed, condensed and returned to the tank. It can also be used as feed stock for the adjoining ammonium nitrate plant.

Polyethylene — Aggregate Forms New Paving Material

A new paving material compounded of pigmented polyethylene and aggregate promises to bring color-coding of roads and runways closer to reality. It can be mixed and applied (in a one-inch layer) using conventional machinery and methods. Brilliant white test curbing, shown being installed in the photo above, defines road boundaries. Other possible uses include multi-colored home driveways, tennis courts, sidewalks, swimming pools.

New TVA Process Uses Wet-Process Phosphoric to Make Diammonium Phosphate

TVA engineers are developing a new process to make granular diammonium phosphate fertilizer. It is reported that the method can use low-cost wet-process phosphoric acid without a purification step.

By taking advantage of chemical heat in the reaction of acid and ammonia, recycle rates and drying requirements are reduced below those of some competitive processes, according to TVA. Grade of product depends on purity of phosphoric acid available, and ranges up to 21-53-0. The process is being adapted to production of various grades, some containing potash.

TVA claims that its ammoniator is the key equipment in the process. Wet-process phosphoric acid, such as that made by U.S.I. at Tuscola, Illinois, is partially

MORE

New Type of Carbon Black Obtained from Burning Hydrocarbons in Chlorine

Researchers have obtained high yields of carbon blacks containing chemically bonded chlorine, by burning various hydrocarbons in the halogen gas rather than in oxygen. Such chlorocarbon blacks may have commercial use in rubber and plastics compounding, according to a recent report.

In the study, methane, propane, ethylene and natural gas were burned with submaximal amounts of chlorine to yield carbon black as a major product. By

MORE

CONTINUED

TVA Process

preneutralized in a tank. Then the ammoniation to diammonium phosphate is completed in the ammoniator-granulator drum. Excess ammonia must be fed to the drum to produce diammonium phosphate. Therefore, a scrubber is required to recover ammonia from exhaust gases. Phosphoric acid is fed to the scrubber to absorb ammonia, and the solution is fed to the preneutralizer. A recycle ratio of about 3:1 is required for control of granulation. Physical properties of the closely sized granular product are said to be excellent.

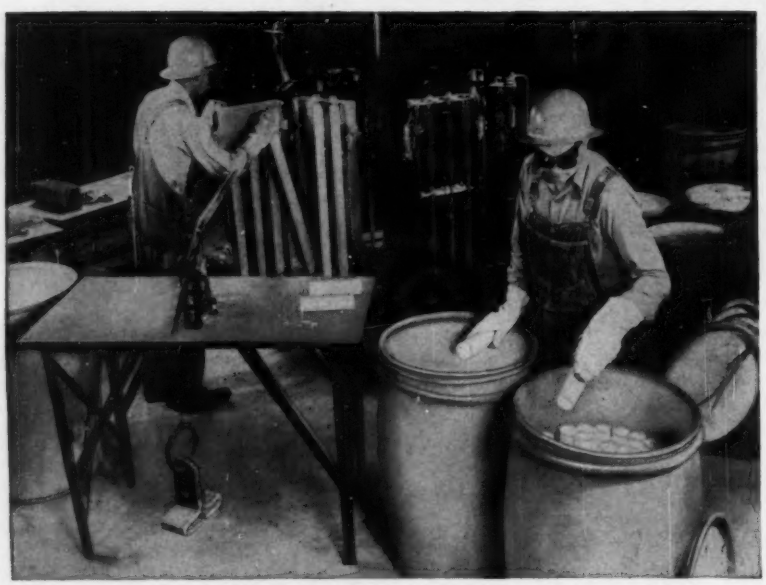
CONTINUED

Chlorocarbon Blacks

contrast, carbon black is only a by-product when these hydrocarbons are burned with oxygen. The quantity of carbon produced in the chlorine-hydrocarbon flames seems to be directly proportional to the chlorine-hydrocarbon ratio. It also seems to depend on the hydrocarbon used, and is greatest for methane.

These carbon blacks can contain as much as 45% chlorine. The halogen appears to be bonded to the carbon chemically, researchers report, since all attempts to remove it have left at least 10% chlorine.

No Oil for Sodium Bricks



Sodium packed under kerosene? Perhaps in the laboratory but not in industry, as you can see from this photo of the cutting and packing operations at U.S.I.'s metallic sodium plant in Ashtabula, Ohio. Every year, many tons of sodium are molded into bricks and packed *dry* in steel drums. An airtight seal is maintained during storage and shipment.

All phases of sodium handling are discussed in the latest edition of U.S.I.'s brochure "Handling Metallic Sodium on a Plant Scale". For your copy, address Technical Literature Department, U.S.I. Chemical News, 99 Park Avenue, New York 16, New York.

TECHNICAL DEVELOPMENTS

Information about manufacturers of these items may be obtained by writing U.S.I.

Chlorine safety data sheet is now being sold by MCA for nominal price. Covers properties, hazards and their engineering control, employee safety, emergency measures, container handling, waste disposal, medical management. **No. 1640**

New group of urethane elastomers now offered for use where abrasion resistance is essential. Claimed more rugged than manganese steel and other metals. Suggested for chute linings, pipeline crawler wheels, scrapers, etc. **No. 1641**

Temperature-indicating crayons and paints now on market are said to check temperatures of hot surfaces by completely changing color. Series of products cover range from 104°F. to 2,462°F. Claimed easy to apply and remove. **No. 1642**

Sodium peroxide is covered in new data sheet giving specifications, typical analysis, properties, shipping data and uses. Technical service is offered on handling and use in pulp and paper, textile and other fields. **No. 1643**

New laboratory oven is said to give highest temperature, combined with vacuum, now available. Can heat from room temperature to 500°F. in one hour, in 11-inch diameter by 12-inch deep vacuum chamber. **No. 1644**

Dry sulfamic acid product—with built-in pH color indicator, corrosion inhibitors, anti-foams, wetting agents—can now be obtained for removal of lime scale deposits from evaporative condensers and cooling tower systems. **No. 1645**

Polyethylene waste and drainage system described in new engineering and parts catalog now available. Said to be complete, permanent, corrosion-resistant. Includes sinks, traps, pipe and fittings, adapters, other equipment. **No. 1646**

Concise conversion tables and circular slide rule, now offered for chemical engineers, is shirt-pocket size. Includes slide rule, table of elements, temperature conversion chart, conversion factors, useful constants and data. **No. 1647**

***m*-Sulfobenzoic acid**—new intermediate for dyes, colors, color developers and couplers, surfactants, textile treating agents, flavors, drugs, preservatives, dehydrating agents—is subject of data sheet recently released. **No. 1648**

Fallout is subject of new book which can now be purchased. Book covers bomb types, meteorological dispersion and persistence of fallout, effects of radiation, radiation sickness, biological effects, nuclear war, civil defense. **No. 1649**

PRODUCTS OF U.S.I.

Heavy Chemicals: Anhydrous Ammonia, Ammonium Nitrate, Nitric Acid, Nitrogen Fertilizer Solutions, Phosphatic Fertilizer Solution, Sulfuric Acid, Caustic Soda, Chlorine, Metallic Sodium, Sodium Peroxide.

Organic Solvents and Intermediates: Normal Butyl Alcohol, Amyl Alcohol, Fusel Oil, Ethyl Acetate, Normal Butyl Acetate, Diethyl Carbonate, DIATOL®, Diethyl Oxalate, Ethyl Ether, Acetone, Acetoacetanilide, Acetoacet-Ortho-Chloranilide. Acetoacet-Ortho-Toluidide, Ethyl Acetoacetate, Ethyl Benzoylacetate, Ethyl Chloroformate, Ethylene, Ethyl Sodium Oxalacetate, Sodium Ethylate, Urethan U.S.P. (Ethyl Carbamate), Riboflavin U.S.P.

Pharmaceutical Products: DL-Methionine, N-Acetyl-DL-Methionine, Urethan USP, Intermediates.

Ethyl Alcohol: Pure and all denatured formulas; Anhydrous and Regular Proprietary Denatured Alcohol Solvents SOLOX®, FILMEX®, ANSOL®M, ANSOL PR

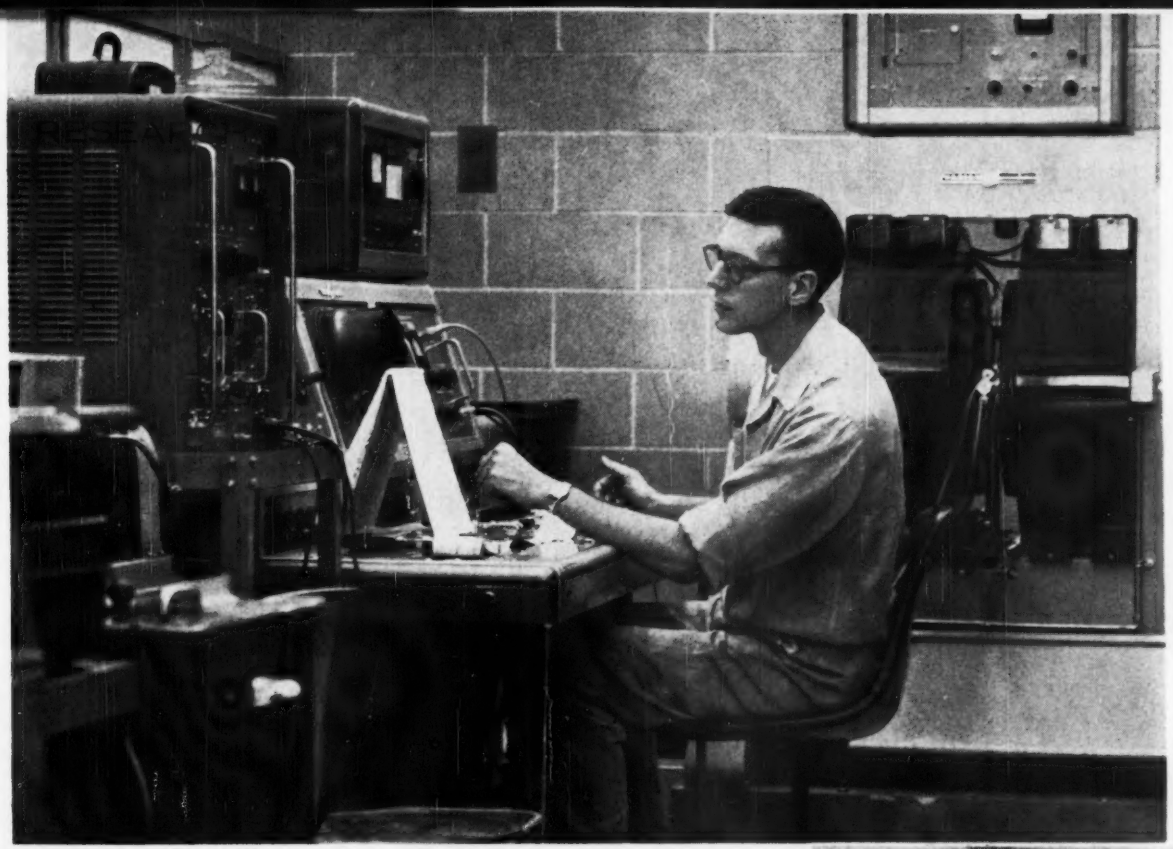
PETROTHENE® . . . Polyethylene Resins

MICROTHENE . . .Finely Divided Polyethylene Resin.

Animal Feed Products: DL-Methionine, MOREA® Premix (to authorized mixer-distributors).

U.S.I. INDUSTRIAL CHEMICALS CO.
Division of National Distillers and Chemical Corporation
99 Park Avenue, New York 16, N. Y.

U.S.I. SALES OFFICES
Atlanta • Baltimore • Boston • Chicago • Cincinnati • Cleveland
Detroit • Kansas City, Mo. • Los Angeles • Louisville • Minneapolis
New Orleans • New York • Philadelphia • St. Louis • San Francisco



NUCLEAR MAGNETIC RESONANCE SPECTROMETER

New Men at the Machines

An increasing number of researchers are doing their own analytical work instead of letting company central groups do it. And management favors the plan, because it saves time and money and better utilizes expensive analytical equipment (see pictures). There's still support for analytical specialists—but their role is being modified.

Few firms have decentralized their analyses to the extent that Inorganic Chemicals Division of Monsanto's Research Dept. (St. Louis) has. Almost one-third of its 150 staffers are qualified to operate the division's expensive and more complicated instruments such as X-ray diffraction apparatus.

But many companies or organizations, such as Stanford Research Institute (Menlo Park, Calif.), Ethyl Corp. (Baton Rouge, La.), Esso Research Laboratories (Baton Rouge), Shell Development (Emeryville, Calif.), Dow Chemical's Texas Division (Freeport, Tex.), and Armour Research Foundation (Chicago), have decentralized analytical work to some extent. Occasionally, even where analysis is strongly centralized, as at the newly dedicated Pfizer Medical Research Laboratories (Groton, Conn.), the benefits of decentralization are being reweighed.

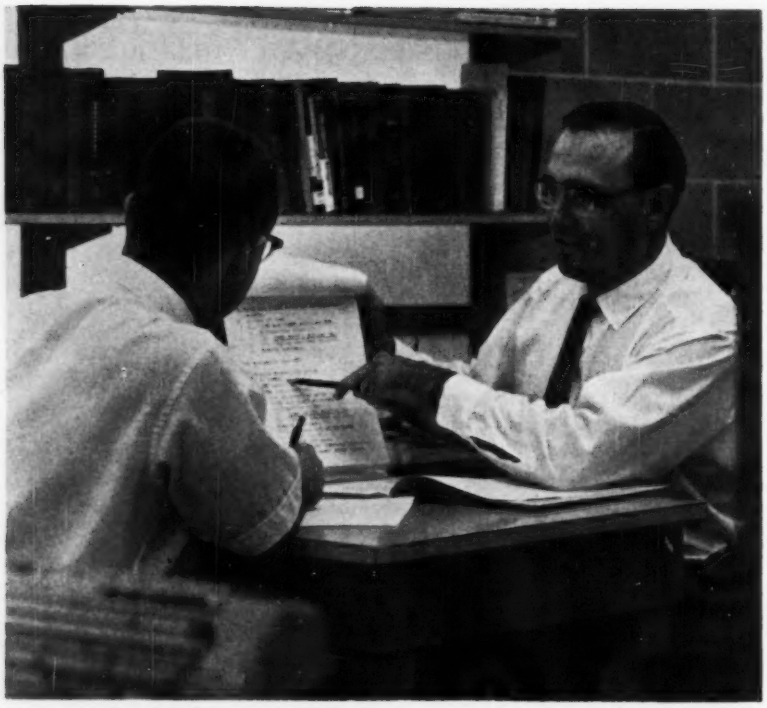
Three-Year Success: Monsanto's plan, inaugurated three years ago, has been highly successful, according to the division's research chemist, Emmett Kaelble, and its assistant director, Clayton Callis. The division abandoned its use of a service group, which analyzed and reported on samples submitted by the research staff; it turned to a system that allows all instruments — absorption spectrometers, gas chromatographs, particle-size apparatus, nuclear magnetic resonance spectrometers, electron microscope, and X-ray spectrometers— to be available to all staffers.

There are still technicians who do routine work, primarily students who work nights. But the idea is to give research scientists the opportunity to personally operate the analytical instruments whenever they wish.

The company's system has been put into operation with considerable care. It calls for preparation of de-

X-RAY DIFFRACTOMETER

PARTICLE ANALYZER



Monsanto's Kaelble and Callis plan instrument training course.

tailed operating instructions for each major piece of equipment. These are distributed to all staffers. Manuals provided by instrument manufacturers are used as often as possible, but these are sometimes incomplete, out of date, difficult to follow, or even nonexistent, Callis says.

Flipchart operating instructions on or near the respective instruments serve as operating checklists for personnel who use the equipment infrequently. A series of seminars cover principles, techniques, applications, data interpretation and instruction in the operation of specific instruments.

Scheduling, Maintenance: Wide leeway in the use of elaborate equipment would appear to have disadvantages. Not so, says Callis. Scheduling, for example, is no problem. "We simply place a calendar at each instrument. Users sign up for the time they want, and the very few conflicts that arise are settled by the individuals involved."

Nor has maintenance proved excessive. "We have experienced only the normally expected amount of downtime," says Callis. "And few, if any, of the breakdowns that have occurred could be traced to misuse. The flipcharts have certainly minimized damaging operational errors." Manufacturers' development of improved instruments—simpler to operate and more rugged than their predecessors—also keep maintenance down.

Moreover, decentralized analysis has boosted morale (none of the division's chemists can complain of having routine analytical duties only); interpretation of data is frequently more accurate (the investigator can spot details that might evade a less interested analyst); workloads are balanced; money is saved (analytical service groups set up to handle peak analytical loads required for special projects tend to "make work" during slack periods); and researchers keep their analyses to a necessary minimum, unlike cases in which analyses are simply requested from a service group.

Wasted Skills? Callis concedes that the division sometimes has "high-priced people" running samples, but adds, "In almost every case, it's voluntary. In a service-group arrangement, they are not given this chance. Many important discoveries have undoubtedly been missed because some unexpected observation was unnoticed by a technician.

"Our objective is to solve research problems; and people directly involved with a certain project give the extra effort and time required for good work. Since running samples is not their primary job, they can easily do other things while a sample is running. We rarely find people sitting, watching the diffractometer while a sample is being run.

"High-priced people do not run all the samples, however. Groups use their own nontechnical help and technicians operate the equipment on the evening shift."

Self-Service Trend: While not all laboratories that have tried decentralization have gone as far as Monsanto, arguments for "do-it-yourselfing" seem to be increasing.

Until about three months ago, Armour Research Foundation had a centralized analytical section. When it didn't prove entirely satisfactory, says George Gordon, director of chemical and engineering research, the analytical work was spread around to the various scientific disciplines (e.g., physical chemistry) at ARF. But analysis is still centralized in these groups, so ARF hasn't followed the Monsanto pattern completely.

Says Gordon, "The more a researcher knows about the analytical function, the more he knows about his subject in general."

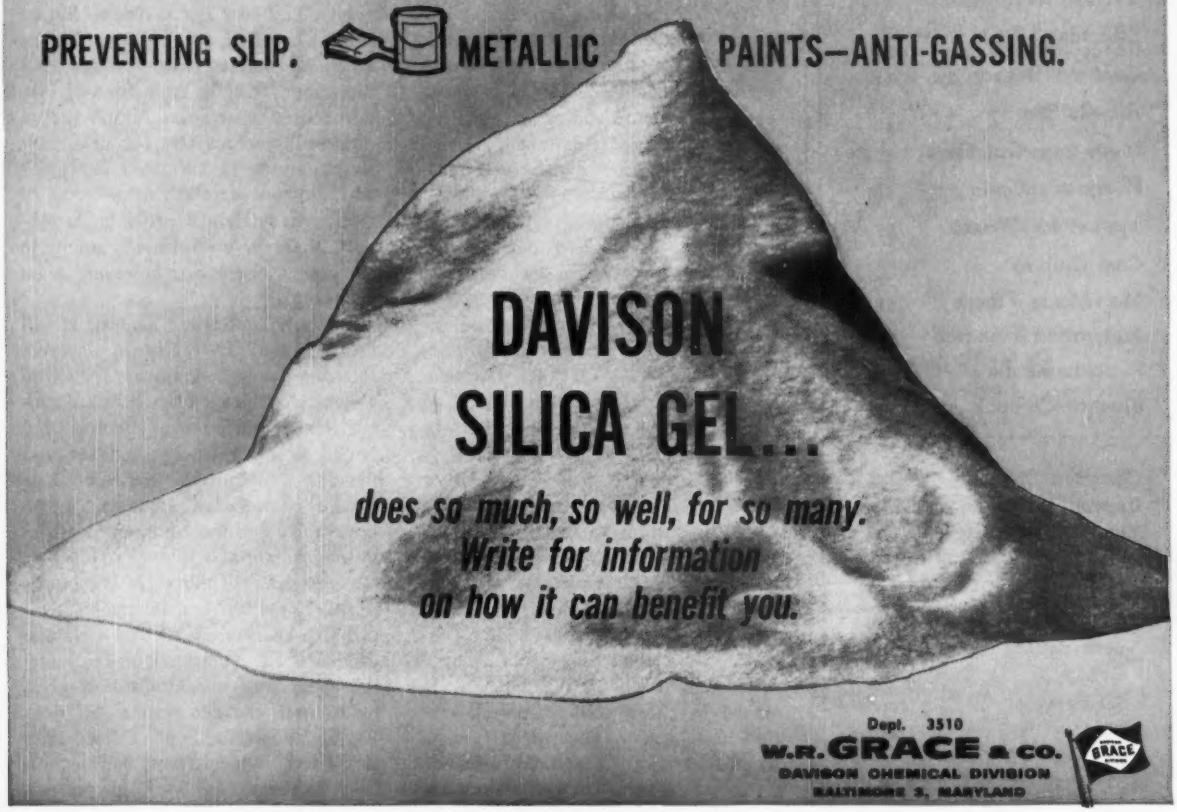
He warns, however, that full decentralization can mean neglect of equipment unless some individual is given responsibility for overseeing its care. (Monsanto's Inorganic Division assigns this chore to a group leader in the physical area of a given instrument.)

Gordon also cautions that the research chemist may waste time on analytical work if he has to look up procedures, standardize chemicals, take data, etc.

At another major independent research organization — Stanford Research Institute — staffers do their own analyses because it's considered the most efficient method, especially because routine analyses have not been commonplace.

Middle Ground: Shell Development's Stanley Perry, head of the analytical department, treads the middle ground between the extreme views on centralization. "The burden of providing the analytical service required by our research," he explains, "is shared about equally by the research department and the central analytical service groups. Our management en-

PLASTICS—FLATTING OF SHEETING, BAKED ALKYD UREAS, VINYLS, CLEAR SYNTHETIC RESINS. INDUSTRIAL CATALYSTS—BASE FOR MANY CATALYSTS. REFRIGERATION—STOPPING CORROSION AND FREEZE-UP. PAINT AND VARNISH—FLATTING. PACKAGING—DEHYDRATION; PROTECTION FROM MOISTURE. NATURAL GAS—DEHYDRATING GAS STREAMS. PRINTING INKS—ANTI-BLOCKING. COSMETICS—ANTI-CAKING. PHARMACEUTICALS—ANTI-CAKING. WAXES—PREVENTING SLIP. METALLIC PAINTS—ANTI-GASSING.



DAVISON
SILICA GEL...

does so much, so well, for so many.
Write for information
on how it can benefit you.

Dept. 3510
W.R. GRACE & CO.
DAVISON CHEMICAL DIVISION
BALTIMORE 3, MARYLAND

FYI:
Chemical Week Reprints

Hercules Powder Co.	$1 ☐
Metal Organics	$1 ☐
Food Additives	$1 ☐
European Market	$1 ☐
Energy	$1 ☐
Boron/Borax	$1 ☐
Jet Fuels	$1 ☐
Long-Range Planning	$1 ☐
Propylene	$1 ☐
Butylenes	$1 ☐
Acetylene	$1 ☐
Ethylene Products	$1.50 ☐
Foreign Trade	$1 ☐
Cellulose	$1 ☐
Rating Research	$1 ☐
Cost Accounting	$1 ☐
World Sulfur	$1 ☐
Aromatics in Trouble	$1 ☐
Vertical Integration	$1 ☐
Steroids	$1 ☐
Contract Research	$1 ☐
Atomic Energy	$1 ☐
Ideas from Outsiders	$1 ☐
Pharmaceuticals	$1 ☐
Market for Waxes	$1 ☐
Cost Cutting	$1 ☐
Man-Made Fibers	$1 ☐
Motivation Research	$1 ☐
Petrochemicals	$1 ☐
Plastics Outlook	$1 ☐

Chemical Week
Reprint Dept., Room 2400
330 W. 42nd Street
New York 36, N. Y.

Please send me the CW Reports checked above. Enclosed is $ .....
Send price of ..... copies

(Bulk prices on request)

courages chemists to do part of their own analytical work, and it provides rather extensive analytical services to help with problems that research cannot conveniently handle unaided. We think this system balances the supply and demand for the analytical services."

At Shell, the three major functions of the centralized group are:

(1) The service group helps develop or modify analytical methods for the chemists, leaving the chemist or his laboratory system to do the actual analyses. If necessary, the central team also trains the chemist or his assistant in the new techniques.

(2) If the analytical work is more complex, either because of the method or equipment required, the work is handled by the central analytical group. This group also maintains the equipment.

(3) When a research department requires a large amount of analytical work on a continuing basis, a "satellite" analytical center is established in the research department. Personnel are contributed by both the analytical and research departments, and the work is directed by a member of the central analytical group.

Esso Research Laboratories also has a centralized analytical section that's available to research chemists who can either use its services or, with supervision, learn and practice the use of its sophisticated equipment.

Learn the New Ones: Several "centralized" firms surveyed make an exception in the special types of new equipment. Ethyl Corp. doesn't train its research chemists in the use of the electron microscope, for example, but it does encourage liberal use of gas chromatography equipment. So does Dow Chemical's Texas Division, which similarly feels that this is an important tool its staff should know how to handle.

The strongly centralized Pfizer Medical Research Laboratories — drug firms seem to favor centralization—boasts an impressive array of polarimeters, ultraviolet and infrared absorption apparatus, and the like, at its new multimillion-dollar center.

A "physical measurements group," headed by Richard Wagner, Jr., is subdivided into a routine analysis section (one senior chemist, 10 technicians) and an analytical research section (two senior chemists, two technicians) that explores totally new analytical problems and methods such as those for new drugs.

Researchers use a standard paper form (where type of data required can be checked); they submit this form along with the sample to be analyzed. I. A. Solomons, assistant director of chemical research and development, says he prefers this system because, "We are sure that it's easier on equipment and permits more efficient utilization of it. More than that, there's one obvious reason: the research chemists prefer it this way."

But Solomons has given some thought to partial decentralization, conceding that this might reduce the analytical workload, eliminate some unnecessary analyses that are routinely requested. He feels that complete decentralization is more feasible, however, in an inorganic laboratory, such as Monsanto's, where the staff is oriented by academic training (e.g., in physical chemistry) and skills toward the proper handling of laboratory instruments.

Specialists' Role: Arthur Weston, director of research at Abbott Laboratories (North Chicago, Ill.) also admits that indiscriminate use of analysis service can be a real problem. But he points out that for best results the complex analyses (tissue cultures, radioisotope tracing, etc.) done at Abbott require specialists. Abbott is fundamentally centralized, but does have its apparatus in various laboratories and allows researchers to do some of their own analytical probing. At Abbott, there is no formal training in equipment operation, however, as at Monsanto.

Strongly centralized analysis is still the choice of several firms surveyed. Reasons vary. Armour Industrial Chemical (Chicago) lets bench chemists check their own melting and boiling points, refractive indexes, and the like, but insists that specialists handle complicated analyses. It believes this saves time, minimizes errors in interpretation.

Copolymer Rubber & Chemical Corp. (Baton Rouge), Jefferson Chemical Co. (Austin, Tex.) and Celanese Chemical Co. (Clarkwood, Tex.) feel the same way — centralization gives better and cheaper results. So does Pacific Vegetable Oil Corp. (San Francisco), which trains lab technicians to do routine work, also puts a

Need Cash?

Want to step up your sales to Chemical Process Industries plants? Like to add new customers' names to your ledger? Want to make sure busy management buyers don't miss you when they're seeking a new source of supply? Isn't it important to remind old customers how ready and able you are to serve them?

Put your product in the right place at the right time and watch the customers come to you! That means the "shopping center" pages of the Chemical Week BUYERS' GUIDE ISSUE, the CPI's most used directory and composite catalog. And it's on the desks, right within reach of the same 45,000 management men who subscribe to and read Chemical Week regularly.

Next year's edition... more useful than ever to CPI-Management, more profitable than ever for you. Cover and content restyled for more convenience, better readability . . . new service features planned . . . plus more equipment company listings and more types of CPI equipment covered. Don't delay! Budget your selling space now in the 1961 . . .

Chemical Week BUYERS' GUIDE ISSUE

Chemical Week

ADVERTISERS' INDEX

ALLIED CHEMICAL CORP., GENERAL CHEMICAL DIV. Agency—Kastor, Hilton, Chesley, Clifford & Atherton, Inc ..... 4th cover

ALLOY STEEL PRODUCTS CO. Agency—Chirurg & Cairns, Inc. 57

AMOCO CHEMICAL CORP. Agency—D'Arcy Advertising Co. 85

ARMOUR PHARMACEUTICAL CO. Agency—Jordan-Sieber & Corbett, Inc. .. 84

ATLANTIC REFINING CO. Agency—N. W. Ayer & Son, Inc. 51

BAKER CHEMICAL CO., J. T. Agency—Wildrick & Miller, Inc. 62-63

BECKMAN INSTRUMENTS, INC. Agency—Charles Bowes Adv., Inc. 53

BLOCKSON CHEMICAL CO. Agency—Wm. Balsam Adv. 14

BUTLER MANUFACTURING CO. Agency—Aubrey, Finlay, Marley & Hodgson, Inc. 23

BZURA CHEMICAL CO., INC. Agency—Ray Ellis Advertising, Inc. 41

CELANESE CORP. OF AMERICA Agency—Ellington & Co., Inc. 16-17

CHASE BAG CO. Agency—Hazard Advertising Co. 24

CHEMICAL WEEK BUYERS' GUIDE 93

COLORADO DEPT. OF DEVELOPMENT Agency—William Kostka & Assoc., Inc. 52

COMMERCIAL SOLVENTS CORP. Agency—Fuller & Smith & Ross, Inc. .. 47

CONTINENTAL CAN CO. Agency—Batten, Barton, Durstine & Osborn, Inc. 6

CROWN CORK & SEAL CO. Agency—Aitkin-Kynett Co. Adv. 19

DISTILLATION PRODUCTS INDUSTRIES, DIV. OF EASTMAN KODAK CO. Agency—The Rumrill Co., Inc. 49

DOW CHEMICAL CO., THE Agency—MacManus, John & Adams, Inc. 54-55

DOW CHEMICAL CO., THE (SARAN LINED PIPE) Agency—MacManus, John & Adams, Inc. 64

DOW CORNING CORP. Agency—Church & Guisewite Adv., Inc. 2

DUPONT DE NEMOURS & CO., INDUSTRIAL & BIOCHEMICALS DEPT. Agency—Batten, Barton, Durstine & Osborn, Inc. 45

EAGLE PICHER CO. Agency—The Ralph H. Jones Co. 83

ENJAY CHEMICAL CO., A DIV. OF HUMBLE OIL & REFINING CO. Agency—McCann-Erickson, Inc. 38

EVANS CHEMETICS, INC. Agency—Ritter, Sanford, Price & Chalek, Inc. 36

FMC MINERAL PRODUCTS DIV., FOOD MACHINERY & CHEMICAL CORP. Agency—James J. McMahon Adv. 9-12

FRUEHAUF TRAILER CO. Agency—The Allman Co., Inc. 70-71

GAYLORD CONTAINER DIV. OF CROWN ZELLERBACH CORP. Agency—French Advertising, Inc. 80

GENERAL AMERICAN TRANSPORTATION CORP. Agency—Edward H. Weiss & Co. 8

GENERAL MILLS, INC. Agency—Knox Reeves, Adv., Inc. 42

GRACE & CO., W. R., DAVISON CHEMICAL DIV. Agency—Van Sant Dugdale & Co., Inc. 91

GREAT LAKES CARBON CORP. Agency—Davis-Parsons & Strohmeier Adv. 68

GULF OIL CORP. Agency—Ketchum, MacLeod & Grove, Inc. ..... 3rd cover

HARSHAW CHEMICAL CO. 1

HAWS DRINKING FAUCET CO. Agency—Pacific Advertising Staff 84

HERCULES POWDER CO. Agency—Fuller & Smith & Ross, Inc. 76

HOOKER CHEMICAL CORP. Agency—The Rumrill Co., Inc. 58

JOHNS MANVILLE CORP. Agency—Cunningham & Walsh, Inc. 18

LUCIDOL DIV. WALLACE & TIERNAN, INC. Agency—Barber & Drullard, Inc. 86

M&P BUILDING SALES Agency—Erwin Wasey, Ruthrauff & Ryan, Inc. .. 50

MICHIGAN CHEMICAL CORP. Agency—Aves, Shaw & Ring, Inc. 56

NEVILLE CHEMICAL CO. Agency—Bond & Starr, Inc. 75

PENNSYLVANIA DEPT. OF COMMERCE Agency—Bachman, Kelly & Trautman, Inc. 44

PENNSALT CHEMICALS CORP. Agency—The Aitkin-Kynett Co., Inc. 82

PERMUTIT DIV., PFAUDLER PERMUTIT, INC. Agency—The Rumrill Co., Inc. 13

PFIZER & CO., INC., CHAS. Agency—MacManus, John & Adams, Inc. ... 79

PITT-CONSOL CHEMICAL CO. Agency— RAF Advertising, Inc. 48

RESISTOFLEX CORP. Agency—Adams & Keyes, Inc., Adv. 15

RHODIA, INC. Agency—Sudler & Hennessey, Inc. 7

SHANCO PLASTICS & CHEMICALS, INC. Agency—Gordon J. Weisbeck, Inc. 52

SHAWINIGAN RESINS CORP. Agency—Wilson, Haight & Welch, Inc. Adv. 69

SHELL CHEMICAL COMPANY Agency—J. Walter Thompson Co. ..... 2nd cover

SINCLAIR PETROCHEMICALS, INC. Agency—Geyer, Morey, Madden & Ballard, Inc. 4

SOUTHERN STATES CONTAINER DIV., REYNOLDS ALUMINUM SUPPLY CO. Agency—George & Glover, Adv. 72

SPROUT, WALDRON & CO., INC. Agency—Charles E. Williams Adv. 46

STEPAN CHEMICAL CO. Agency—Frank C. Nahser, Inc. 20

UNION BAG-CAMP PAPER CORP. Agency—Smith, Hagel & Knudsen, Inc. 67

UNION CARBIDE CHEMICALS CO., DIV. OF UNION CARBIDE CORP. Agency—J. M. Mathes, Inc. 35

UNION STEEL CORP. Agency—Randolph Assoc. Adv. 37

U. S. BORAX & CHEMICAL CORP. Agency—Howard M. Irwin & Assoc. 61

U. S. INDUSTRIAL CHEMICALS CO. Agency—G. M. Basford Co. 87-88

WESTERN CONDENSING CO. Agency—Batten, Barton, Durstine & Osborn, Inc. 33

WOLF DIV., JACQUES, NOPCO CHEMICAL CO. Agency—Gray & Rogers Advertising 65

WYANDOTTE CHEMICALS CORP. Agency—Brooke, Smith, French & Dorrance, Inc. 30

ADVERTISING STAFF

Atlanta 9 ..... Michael Miller, 1375 Peachtree St., N.E. TRinity 5-0523

Boston 16 ..... Paul F. McPherson, Copley Square, COngress 2-1160

Chicago 11 ..... Alfred D. Becker, Jr., R. J. Claussen, 520 N. Michigan Ave., MOhawk 4-5800

Cleveland 13 .... H. J. Sweger, Duncan C. Stephens, 1164 Illuminating Bldg., 55 Public Square, SUperior 1-7000

Dallas 1 ..... Gordon Jones, John Grant, 901 Vaughan Bldg., 1712 Commerce St., RIverside 7-9721

Denver 2 ..... J. Patten, 1740 Broadway, ALpine 5-2981

Detroit 26 ..... H. J. Sweger, Jr., 856 Penobscot Bldg., WOodward 2-1793

Frankfurt/Main ..... Stanley Kimes, 85 Westendstrasse, Germany

Geneva ..... Michael R. Zeynel 2 Place du Port, Geneva, Switz.

Houston 25 ..... Gene Holland, W-724 Prudential Bldg., JAckson 6-1281

London E.C. 4 ..... E. E. Schirmer, N. Murphy, McGraw-Hill House, 95 Farringdon St., England.

Los Angeles 17 ..... Robert Yocom, 1125 West Sixth St., HUntley 2-5450

New York 36 ..Charles Haines, B. A. Johnson, P. E. McPherson, Charles F. Onasch, L. Charles Todaro, 500 5th Ave., OXford 5-5959

Philadelphia 3 ....William B. Hannum, Jr., J.E.B. Ladouceur, 6 Penn Center Plaza, LOcust 8-4330

Pittsburgh 22 .....Duncan C. Stephens, 4 Gateway Center, EXpress 1-1314

Portland 4 ..... Scott B. Hubbard, Room 445, Pacific Bldg.

St. Louis 8 ..... R. J. Claussen, 3615 Olive St., Continental Bldg., JEfferson 5-4867

San Francisco 4 ..... William C. Woolston, 68 Post St., DOuglas 2-4600

quality-control laboratory at researchers' disposal.

But as instruments become easier to operate and maintain, and chemists grow more adept in their use, there's a good chance that self-service analysis may become the rule, rather than the exception, in many research laboratories.

Versatile Tester

The tricky job of determining rubber-processing characteristics when only a small sample is available is being handled by a new instrument developed at Firestone Tire & Rubber Co.'s research laboratory (Akron, O.).

The new tester, developed by research physicist William Claxton, can be used in studies of rubber curing, extrusion, plasticity and recovery, is named CEPAR.

Speed and economy result from using one tester instead of five or six machines and because five grams of sample can be used rather than the conventional 1 lb. or more.

Firestone has been using a pilot model of the patented instrument for two years. Chief uses have been studies of compounding, cracking of elastomers during molding of tires and detection of bad batches of rubber.

EXPANSION

• Allied Chemical's Solvay Process Division is starting work on doubling the size of its Syracuse, N.Y., research and technical service labs. The increased space, to be ready by late '61, will be used for research on new high-temperature and space-age applications of chromium chemicals, and for application studies of propylene oxide polyethers, chlorinated organics and hydrogen peroxide.

• Geophysics Corp. of America, formerly in Boston, has moved its corporate offices and the research and development facilities of the Physics Research Division to Burlington Rd., Bedford, Mass. The division includes the departments of ion physics and chemical physics.

• Hewlett-Packard Co., maker of laboratory measuring equipment, has completed a $4.5-million administrative center, plant and laboratory at the Stanford Industrial Park (Palo Alto, Calif.).

Tracers TO THE CHEMICAL PROCESS INDUSTRIES

Published: each Saturday—closes 11 days in advance.

Rate—$3.00 per line ($1.50 per line for position wanted ads), minimum 3 lines. Allow 5 average words as line; Count one half line for box number.

ADDRESS BOX NO. REPLIES TO: Box No. Classified Adv. Div. of this publication. Send to office nearest you.
NEW YORK 36: P. O. BOX 12
CHICAGO 11: 520 N. Michigan Ave.
SAN FRANCISCO 4: 68 Post St.

POSITIONS VACANT

Polyester Resin Chemist: experienced in formulation and application of resins for hand-lay-up, matched metal molding preform and premix. Salary commensurate with experience. Contact American Alkyd Industries, Carlstadt, New Jersey—Geneva 8-4332.

Research Scientists—Established food manufacturer with foreign subsidiaries needs young scientists in Research and Development Department of of New Jersey, fifty miles from N.Y.C. We pay first-class academic background in some branch of experimental science. Some research experience, either academic (Ph.D.) or industrial, is essential; knowledge of the food industry is helpful but not necessary. Adaptability to cooperating with European colleagues is important and availability for possible occasional trips to Europe required. Starting salary will be in five figures depending upon qualifications. Fringe benefits are exceptionally liberal and opportunity for advancement will be commensurate with performance. Our modern plant is located in scenic rural section of New Jersey, fifty miles from N.Y.C. We pay moving expenses. Please send complete resume of your qualifications and fields of interest. Current affiliations will not be investigated without permission. P-5465, Chemical Week.

POSITIONS WANTED

Technical or Operations Manager B.CH.E. 1943. Seventeen years in production, sales, development, and General Manager specialty chemical field. Of value similar position or market development. PW-5485, Chemical Week.

Technical Service Director B.CH.E. experienced in direction of development (Product, Manufacturing, Marketing) in applications of fibers and/or resins. PW-5472, Chemical Week.

If you are a manufacturer seeking new or added sales outlets—or if you are a manufacturer's agent or chemicals distributor with the capacity, time and energy to take on additional lines—make your interests known in this column of Chemical Week. The right agent or jobber teamed up with the saleswise manufacturer makes the right combination for the hard selling days ahead. There's profit for both, which can be initiated through low-cost classified advertising. Write Employment Opportunities, Chemical Week. P.O. Box 12, New York 36, N.Y.

SELLING OPPORTUNITY WANTED

Manufacturers Agent—Buffalo, New York and vicinity now selling chemicals to electro-plating and foundry industry needs additional lines for industry in general—Reference available. RA-5486, Chemical Week.

The Consulting Engineer. "By reason of special training, wide experience and tested ability, coupled with professional integrity the consulting engineer brings to his client detached engineering and economic advice that rises above local limitations and encompasses the availability of all modern developments in the fields where he practices as an expert. His services, which do not replace but supplement and broaden those of regularly employed personnel, are justified on the ground that he saves his client more than he costs him."

PROFESSIONAL SERVICES

Clark Microanalytical Laboratory—CH. N. S. Halogen, Flourine, Oxygen, Alkoxyl, Alkimide, Acetyl, Terminal Methyl, etc. by specialist in organic microchemical analysis. P.O. Box 17, Urbana, Ill., Empire 7-8406.

Technical Guidance by Martin H. Gurley, Jr., Research Advisory Service, RFD. 4 Lexington, Va. COngress 1-3294.

CONTRACT WORK WANTED

Custom Grinding-Ultra Fine or Coarse-Specialty or Volume Blending and Grinding service on unit or contract basis. Complete CO^2 installation for Nylon, Teflon and Heat Sensitive Materials. A Cramer Corp., 10881 S. Central Avenue, Box 682, Oak Lawn, Illinois.

CHEMICALS FOR SALE

60 Lypks. Aluminum Stearate 32¢ lb. Bulk DOS Plast. 32¢/lb. (dark). Bulk DBS Plast. 33¢/lb. w/w. Bulk Acetone Redistilled 43¢/gal. FS-5413, Chemical Week.

FOR SALE OR LEASE

Chemical Tank Trailers, stainless steel, rubber-lined, pressure all types for sale or lease. Hackett Tank Company, Inc., 541 South 10th Street, Kansas City, Kansas. Phone: Mayfair 1-2363.

EQUIPMENT FOR SALE

Liquidation, $8,000,000 Alcohol Plant at Omaha, Nebraska. Dryers, Filters, Stills Evaporators, Exchangers, Tanks, Pumps, etc. Send for circular. Perry, 1415 N. Sixth St., Phila. 22, Pa.

Vulcan 10'x11' dia.x 175' long rotary kiln ¾" shell 2 tires firing hood etc. Very attractive price. Perry, 1415 N. Sixth St., Phila. 22, Pa.

T316 Stainless Steel Distillation Column, 96" dia. x 37' high, 30 bubble cap trays. Like new! Perry, 1415 N. 6th St., Philadelphia 22, Pa.

4300 Gallon T316 Stainless Steel Pressure Tank, 6' dia. x 20' long, dished heads. ASME 50# WP. Perry, 1415 N. 6th St., Philadelphia 22, Pa.

WANTED/FOR SALE

This Tracer Section can be used whenever you are looking for or offering Equipment, Plants, Supplies, Chemicals, Opportunities, Special Services. The rates are low—just call or write Classified Advertising Division, Chemical Week, P.O. Box 12, N. Y. 36, N. Y., LOngacre 4-3000.

Don't Forget the box number when answering advertisements. It is the only way we can identify the advertiser to whom you are writing.

WANTED

Autoclave for 1000 gallon Vat, pressure up 65 pounds., ASME coded, plain carbon steel, plain or glass lined. W-5478, Chemical Week.

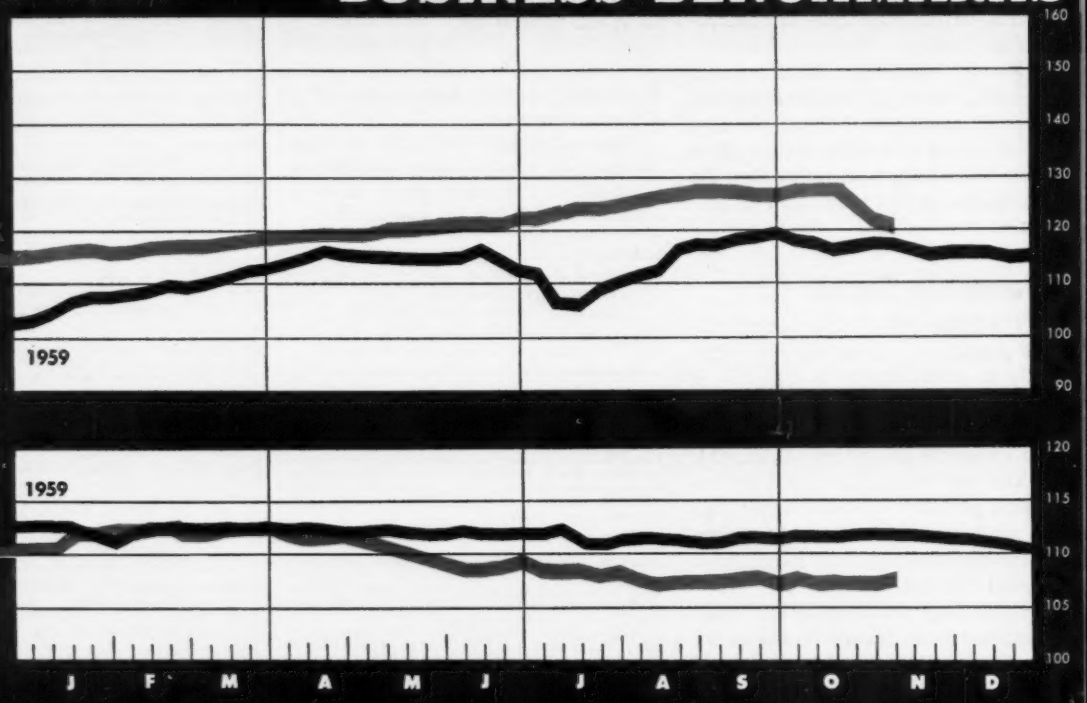
Wanted: Ram extruder for plastic materials. Self contained hydraulic system. Any size will be considered. W-5479, Chemical Week.

MISCELLANEOUS

To Employers Who Advertise for Men: The letters you receive in answer to your advertisements are submitted by each of the applicants with the hope of securing the position offered. When there are many applicants it frequently happens that the only letters acknowledged are those of promising candidates. (Others do not receive the slightest indication that their letters have even been received, much less given any consideration.) These men often become discouraged, will not respond to future advertisements and sometimes even question if they are bona fide. We can guarantee that Every Advertisement Printed Is Duly Authorized. Now won't you help keep our readers interested in this advertising by acknowledging every application received, even if you only return the letters of unsuccessful applicants to them marked say, "Position filled, thank you." If you don't care to reveal your identity mail them in plain envelopes. We suggest this in a spirit of helpful co-operation between employers and the men replying to Positions Vacant advertisements. Classified Advertising Division, McGraw-Hill Publishing Company. "Put Yourself in the Place of the Other Fellow."

Chemical Week

BUSINESS BENCHMARKS

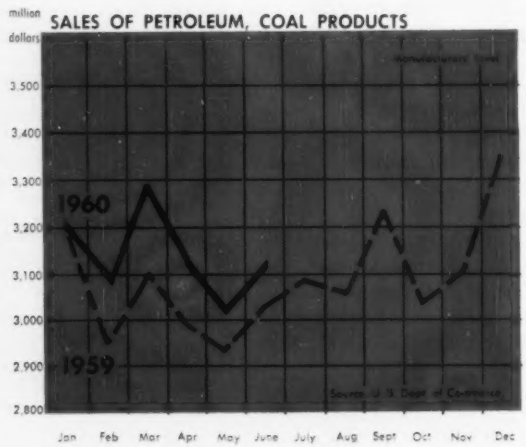


OCTOBER 22, 1960

WEEKLY BUSINESS INDICATORS	*Latest Week*	*Preceding Week*	*Year Ago*
Chemical Week output index (1957=100)	118.3	119.4	117.1
Chemical Week wholesale price index (1947=100)	107.0	106.5	111.5
Stock price index (12 firms, Standard & Poor's)	45.05	44.82	57.87
Steel ingot output (thousand tons)	1,556	1,522	365
Electric power (million kilowatt-hours)	13,725	13,779	13,068
Crude oil and condensate (daily av., thousand bbls.)	6,803	6,849	6,809

EMPLOYMENT INDICATORS (Thousands)	*Latest Month*	*Preceding Month*	*Year Ago*
All manufacturing	16,417	16,489	16,407
Nondurable goods	6,973	6,995	6,889
Chemicals and allied products	889	887	845
Paper and allied products	563	567	560
Rubber products	263	258	264
Petroleum and coal products	228	230	239

CHEMICAL CUSTOMERS CLOSE-UP



GULF... AND THE REMARKABLE PROGRESS OF PETROCHEMICALS

IN TRANSPORTATION... The automobile is a symbol of petrochemicals in action. The rubber, the plastics and fibers, the paints and dyes that make a car, the antifreeze and the fuel and lubricant additives that bring it to life—all depend on petrochemicals for their production. And so it goes with aircraft and with ships. To get from here to there under mechanical power, nowadays, you rely on petrochemicals.

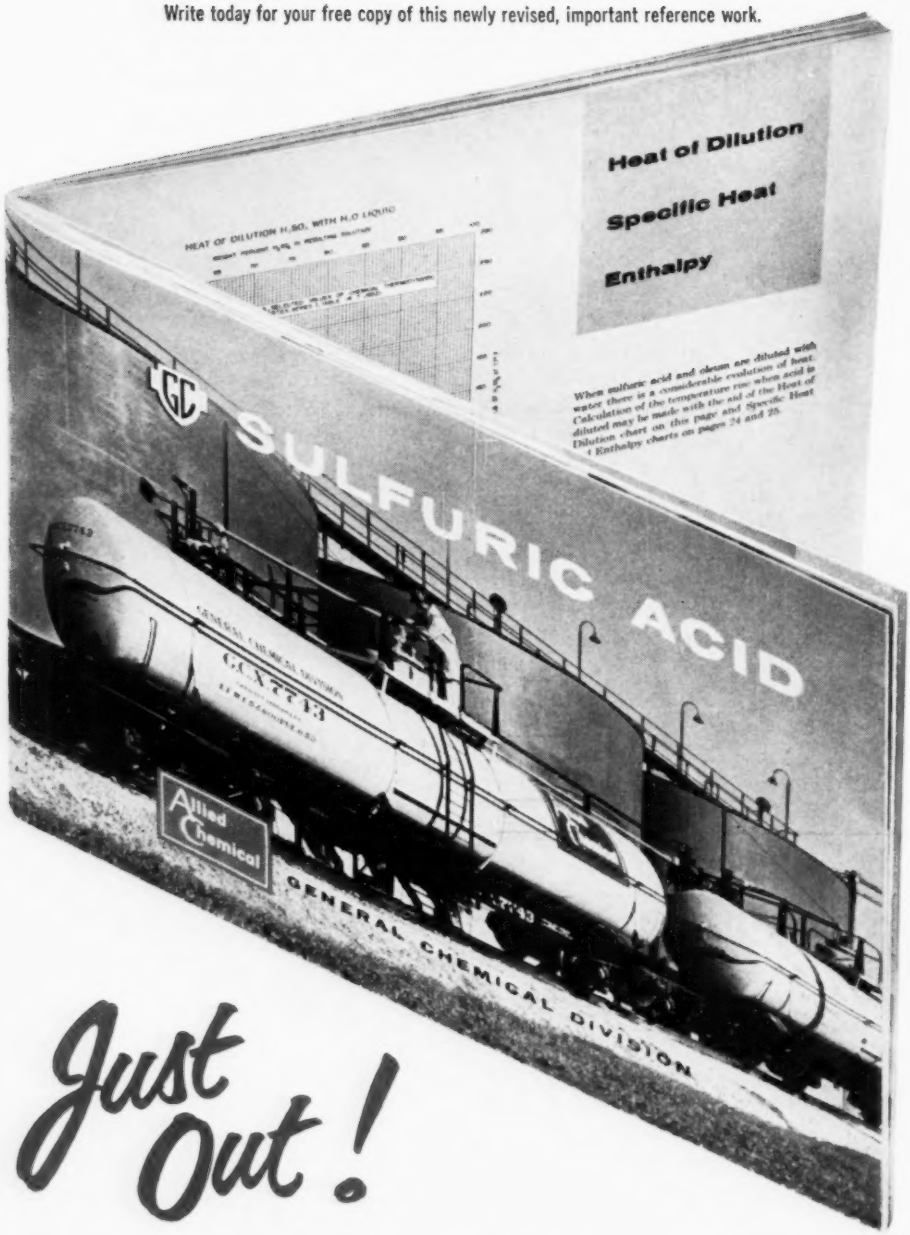
And tomorrow's vehicles—monorails, space craft, manned rockets—will be built from and propelled by chemicals. If your plans include materials and fuels for the vehicles of today—or tomorrow—the petrochemicals industry stands ready to supply new materials. And from Gulf, quality petrochemicals in abundance. Write Petrochemicals Department Sales Office, Gulf Oil Corporation, 360 Lexington Avenue, New York 17, N.Y.

Quality Petrochemicals to Begin With

Benzene • Cyclohexane • Ethylene • Isooctyl Alcohol • Propylene • Propylene Trimer and Tetramer • Sulfur • Toluene

GULF

Write today for your free copy of this newly revised, important reference work.



New enthalpy curves . . . appearing for the first time . . . enable sulfuric users to calculate heat developed and final temperatures when acid is diluted with water.

Just Out!

New edition of General Chemical's valuable sulfuric acid data book!

Here is a revised edition of General's now-classic technical brochure on sulfuric acid—40 pages of charts, graphs and facts from America's foremost producer. This is a comprehensive technical manual with a wealth of data selected for its practical value to sulfuric acid users. Charts have been revised for easier reference, and up-to-the-minute information has been included on uses, manufacture, properties, storage, handling and methods of analysis. Booklet contains material not available from any other source.

If you use sulfuric acid, you cannot afford to be without this valuable reference work. For your free copy write General Chemical on your company letterhead.

Allied Chemical

GENERAL CHEMICAL DIVISION

40 Rector Street, New York 6, N.Y.